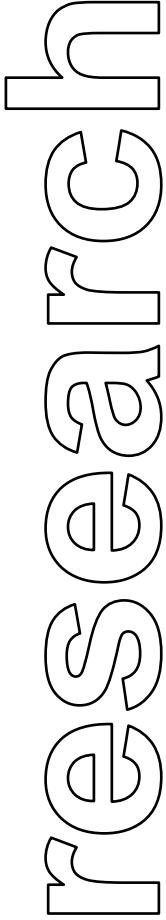


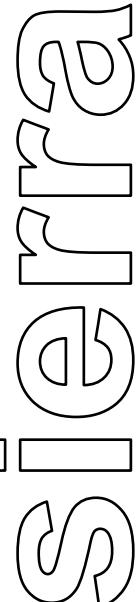
DRAFT



Diesel Particulate Matter Mitigation Plan for the Union Pacific Railroad Colton Rail Yard

prepared for:

Union Pacific Railroad Company



December 9, 2008

prepared by:



Sierra Research, Inc.
1801 J Street
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Union Pacific Railroad Colton Rail Yard**

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Diesel Particulate Matter Mitigation Plan for the Union Pacific Railroad Colton Rail Yard

I. Introduction

In accordance with the 2005 California Air Resources Board (CARB)/Railroad Statewide Agreement (MOU), Union Pacific Railroad Company (UPRR) has prepared this Mitigation Plan for the UPRR Colton Rail Yard. The purpose of this Plan is to outline the potential mitigation measures that can be used to reduce Diesel particulate matter (DPM) emissions from the Yard. The baseline inventory for calendar year 2005 and initial estimates of health risk associated with Yard operations are detailed in the *Health Risk Assessment for the Union Pacific Railroad Colton Railyard* (CARB, 2008).¹ This Plan contains sections detailing how the baseline and projected emissions were calculated, a discussion of projected growth rates and proposed mitigation measures, and a discussion of the mechanisms that will be used to track progress.

As discussed below, the proposed mitigation measures, when fully implemented, will reduce the DPM emissions from the Colton Yard by approximately 42% from 2005 levels, even after accounting for anticipated growth in yard activities (see Section V for a discussion of the predicted growth rate). These emission reductions will concurrently lower any predicted health risk associated with the facility's operations.

II. Summary of Rail Yard Operations

The Colton Yard is a classification yard. The primary function of a classification yard is to "break" arriving trains into sections based on their final destinations, and to build new trains that then depart for the desired destinations. This is accomplished by pushing the connected cars of an arriving train from the Receiving Yard over a "hump" (a raised section of track). Cars are decoupled at the top of the hump and gravity allows the cars to roll into the "bowl." The bowl is a large area with a number of parallel tracks. A computer controls switching each car onto the appropriate track within the bowl. Yard switcher locomotives build new trains by pulling sections of cars out of the bowl, connecting them to others with the same destination(s), and moving them to the Departure Yard, thereby creating a new outbound train.

There is also a locomotive service facility at the Yard that performs both basic service and scheduled and unscheduled maintenance and load testing. In 2005, all service and maintenance was performed at the service track. A new locomotive shop facility was constructed at the east end of the Yard and began operation in 2006.

¹ Available at http://www.arb.ca.gov/railyard/hra/up_col_hra.pdf

Emission sources include, but are not limited to, locomotives, on-road Diesel-fueled trucks, heavy-heavy-duty Diesel-fueled delivery trucks, heavy equipment, and an emergency generator.

III. Emissions Summary

Table 1 shows the DPM emissions from the Colton Yard, by equipment category, for the 2005 baseline year, calendar year 2007, and for future years as the mitigation measures proposed in this Plan are implemented over time. As shown in Table 1, when the proposed mitigation measures are implemented, DPM emissions will be reduced by approximately 42% from 2005 levels, even after accounting for expected growth in yard activities (see Section V for a discussion on the predicted growth rate). These emission reductions will concurrently lower any existing predicted health risk related to facility operations. A detailed discussion of each mitigation measure is provided in Section VI.

Table 1 Summary of Emissions from the UPRR Colton Rail Yard					
Equipment Category	DPM Emissions (TPY)				
	2005 ^a	2007	2010 ^c	2015 ^c	2020 ^c
Locomotives	16.3	15.8	12.8	11.1	9.3
<i>Line Haul</i> ^b	3.6	3.4	3.3	2.6	1.9
<i>Switch</i>	10.0	9.9	7.7	7.3	6.6
<i>Service and Load Tests</i>	2.6	2.5	1.8	1.2	0.8
Light Duty Yard Trucks	0.2	0.1	0.2	0.2	0.2
HHD Diesel-Fueled Delivery Trucks	0.0	0.0	0.0	0.0	0.0
Heavy Equipment	0.1	0.1	0.1	0.1	0.1
Stationary/Portable I.C. Engines	0.0	0.0	0.0	0.0	0.0
Total^d	16.5	16.0	13.0	11.3	9.5

Notes:

- a. From the *Health Risk Assessment for the Union Pacific Railroad Colton Railyard* (CARB, 2008).
- b. Line haul emission estimates include both in-yard activity and by-passing through trains.
- c. Includes growth in Yard-related activities (see Section V) and the proposed mitigation measures (see Section VI).
- d. The numbers shown may not add precisely due to rounding.

IV. Emission Inventory Methodology

A general discussion of the analytical methodology and assumptions for each equipment category used to calculate emissions for the 2005 baseline and calendar year 2007 inventories, and to forecast emissions for calendar years for future years, is provided below and in Appendix A. Detailed emission calculations for the 2005 baseline year can be found in the *Toxic Air Contaminant Emission Inventory and Dispersion Modeling Report for the Colton Rail Yard, Bloomington, California* (Sierra Research, 2007).²

1. Locomotives

Table 2 Summary of Emissions from Locomotives at the UPRR Colton Rail Yard					
Equipment Category	DPM Emissions (TPY)				
	2005 ^a	2007	2010 ^b	2015 ^b	2020 ^b
Line Haul ^c	3.6	3.4	3.3	2.6	1.9
Switch	10.0	9.9	7.7	7.3	6.6
Service and Load Tests	2.6	2.5	1.8	1.2	0.8
Total	16.3	15.8	12.8	11.1	9.3

Notes:

a. From the *Health Risk Assessment for the Union Pacific Railroad Colton Railyard* (CARB, 2008).

b. Includes growth in Yard-related activities (see Section V) and the proposed mitigation measures (see Section VI).

c. Line haul emission estimates include both in-yard activity and by-passing through trains.

Analytical Method for Calculating Emissions

For the 2005 baseline year, emissions from the Colton Yard's operational locomotives were estimated for (1) "road power" (locomotives arriving and departing from the Yard with intermodal and manifest freight trains), (2) yard switching operations, and (3) emissions from locomotive service and maintenance activities.

- 2005 Road Power Emissions – UPRR databases provided basic information on all trains arriving and departing the Colton Yard during calendar year 2005. These data included the number of trains and the number of locomotives on each train. UPRR data also provided the individual locomotive model, emission control technology (as defined by EPA Tier), and whether the locomotive was equipped with automatic start/stop idle controls. Data include trains by-passing the Yard on the mainline track.

² Available at http://www.arb.ca.gov/railyard/hra/sr_col_rpt.pdf

- Emission factors for individual locomotive models and control technologies were adjusted according to CARB guidance for the effects of fuel sulfur content in 2005 for both California fuel and fuel delivered in other states. These emission factors were used to calculate total emissions associated with movements into and out of the Yard based on routes followed, speeds, and throttle settings, as well as estimated idle time on arrival, and idle time prior to departure.
- 2005 Locomotive Yard Operations – Colton Yard operations include operations at the Hump as well as yard switching in the Bowl and elsewhere. Two hump sets were operated, each with three medium horsepower SD-40 locomotives. Other yard switching was conducted using three trim sets, each with two SD-40 locomotives. Emissions for the 2005 baseline year were calculated based on emission factors for the specific locomotive models in use, the hours of operation, and the USEPA switcher duty cycle.
- 2005 Service Operations – Another UPRR database provided detailed information on the number of locomotives fueled and serviced at the Colton Yard. Servicing in 2005, including maintenance and load testing took place primarily at the Service Track, with some activities conducted throughout the Yard.

2007 Emission Inventory

Locomotive emissions for line-haul, service, and maintenance operations were calculated from UPRR data for calendar year 2007 in the same manner as the emissions for the 2005 baseline year, with revisions as necessary to reflect two changes in Yard practices. For 2007, each of the hump sets' configuration changed to two SD-40s with one SD-38. In 2006, the newly built Diesel Shop began operation, resulting in some fraction of locomotive service being performed between the Service Track and the area immediately west of the Shop. Emission factors for 2007 were updated from those for 2005 to reflect the reductions in sulfur content for both California fuel and 47-state fuel. California refinery data show that California fuel sulfur content was reduced from 221 ppm in 2005 to 4.8 ppm in 2007. EPA's 2004 forecasts for sulfur content for 47-state fuel estimated 2639 ppm S for 2005 and 1328 ppm S for 2007.

Yard switching emissions estimates were calculated based on the assumption that hp-hrs of work by switchers is proportional to the total trailing tons of originating and terminating freight, using the 2005 estimate as the baseline. The change in hump set configuration in 2007 resulted in a reduction in total available horsepower from 7500 to 7000. Emission rates for humpsets in 2007 were adjusted to correspond to working horsepower output equivalent to that in 2005. Total trailing tons of freight increased by approximately 1.5% from 2005 to 2007. Trailing tons of freight (and therefore, total yard switching hp-hrs of work) were assumed to increase at 1% per year after 2007.

2010-2020 Emission Inventory Forecast

UPRR locomotive acquisition and retirement projections were used to develop model- and tier-specific growth rates from 2005 to 2012.³ These rates were applied to the observed fleet distribution at the Colton Yard in 2005 to generate 2012 emission factors for the Colton fleet. Locomotive emissions for 2010 were developed by interpolation between the Colton 2007 fleet's emissions and those for 2012 assuming a 1% per year growth in locomotive activity beginning in 2008. The locomotive fleet model and technology distribution for the 2012 inventory was developed from the 2005 base year distribution and UPRR locomotive acquisition and retirement projections. One half of the line haul locomotives at Colton in 2012 were assumed to have the projected distribution. To reflect UPRR's response to the 1998 CARB MOU, the other half of the line haul fleet at Colton in 2012 was assumed to include equal fractions of Tier 2 Dash 9 and SD-70 locomotives. The fuel sulfur content in 2012 was projected to be 15 ppm for California fuel and 123 ppm for 47-state fuel. Emission factors for 2012 were calculated to reflect the projected fuel sulfur content for California fuel and 47-state fuel in the same manner as was used for the 2007 inventory.

Emissions estimates for 2015 and 2020 were projected from the 2012 inventory based on 1% per year growth in activity. In addition, USEPA forecasts of average line haul locomotive emissions presented in the Regulatory Impact Analysis for locomotive emission controls (EPA, 2008) and adjusted for the EPA-assumed growth rate of 1.6% per year in fuel consumption were used to derive control factors reflecting the effects of future mandated improvements in locomotive emission control technology. These control factors were applied to the line haul emissions estimates for 2010, 2015 and 2020.

2. Light Duty Trucks

Table 3
Summary of Emissions from Yard Trucks
at the UPRR Colton Rail Yard

Equipment Category	DPM Emissions (TPY)				
	2005 ^a	2007	2010 ^b	2015 ^b	2020 ^b
Traveling Emissions	0.2	0.1	0.2	0.2	0.2
Idling Emissions	0.002	0.002	0.002	0.002	0.002
Total	0.2	0.1	0.2	0.2	0.2

Notes:

a. From the *Health Risk Assessment for the Union Pacific Railroad Colton Railyard* (CARB, 2008).

b. Includes growth in Yard related activities (see Section V) and the proposed mitigation measures (see Section VI).

³ The 2012 acquisition and retirement projections were submitted to USEPA and CARB as part of the 1998 MOU reporting requirements.

Analytical Method for Calculating Emissions

Emissions from light-duty Diesel-fueled trucks operating at the Yard are based on the engine model year, vehicle class, annual vehicle miles traveled (VMT), and the amount of time spent idling. Vehicle-specific emission factors for travel exhaust and idling were calculated using the EMFAC2007 model.

For calendar years 2007 and 2010-2020, emission factors were calculated using the EMFAC2007 model. It is assumed that the fleet mix and activity data were unchanged from the 2005 baseline year.

3. Diesel-Fueled Delivery Trucks

Table 4 Summary of Emissions from Delivery Trucks at the UPRR Colton Rail Yard					
Equipment Category	DPM Emissions (TPY)				
	2005 ^a	2007	2010 ^b	2015 ^b	2020 ^b
Traveling Emissions	0.00	0.00	0.00	0.00	0.00
Idling Emissions	0.00	0.00	0.00	0.00	0.00
Total	0.00	0.00	0.00	0.00	0.00

Notes:

c. From the *Health Risk Assessment for the Union Pacific Railroad Colton Railyard* (CARB, 2008).
d. Includes growth in Yard-related activities (see Section V) and the proposed mitigation measures (see Section VI).

Analytical Method for Calculating Emissions

Emissions from Diesel-fueled delivery trucks operating at the Yard are based on the engine model year, annual vehicle miles traveled (VMT), and the amount of time spent idling. Vehicle-specific emission factors for travel exhaust and idling were calculated using the EMFAC2007 model.

For calendar years 2007 and 2010-2020, emission factors were calculated using the EMFAC2007 model. It is assumed that the fleet mix was unchanged from the 2005 baseline year. The 2005 baseline year hours of operation were adjusted by a growth rate of 1% per year. As shown in Table 4 above, due to the limited operation of the trucks within the Colton Yard, emissions from this source are negligible.

4. Heavy Equipment

Table 5 Summary of Emissions from Heavy Equipment at the UPRR Colton Rail Yard					
Equipment Category	DPM Emissions (TPY)				
	2005 ^a	2007	2010 ^b	2015 ^b	2020 ^b
Diesel-Fueled Heavy Equipment	0.05	0.05	0.05	0.05	0.06

Notes:

- a. From the *Health Risk Assessment for the Union Pacific Railroad Colton Railyard* (CARB, 2008).
- b. Includes growth in Yard-related activities (see Section V) and the proposed mitigation measures (see Section VI).

Analytical Method for Calculating Emissions

The 2005 baseline year DPM emissions from heavy equipment operated at Colton were based on the number and type of equipment, equipment model year, equipment size, fuel type, and the annual hours of operation. The hours of operation during the baseline year were obtained from UPRR staff. For years 2007 and 2010–2020, the 2005 baseline year hours of operation were adjusted by a growth rate of 1% per year. Equipment-specific emission factors were calculated using the OFFROAD2007 model.

5. Emergency Generator

Table 6 Summary of Emissions from Emergency Generator at the UPRR Colton Rail Yard					
Equipment Category	DPM Emissions (TPY)				
	2005 ^a	2007	2010 ^b	2015 ^b	2020 ^b
Emergency Generator	0.001	0.001	0.001	0.001	0.001

Notes:

- a. From the *Health Risk Assessment for the Union Pacific Railroad Colton Railyard* (CARB, 2008).
- b. Includes growth in Yard-related activities (see Section V) and the proposed mitigation measures (see Section VI).

Analytical Method for Calculating Emissions

Emissions from the stationary emergency generator were calculated based on the size of the engine and the annual hours of operation. Emission factors for the stationary engine were taken from AP-42, Table 3-3.1. Since the operation of these units is not directly

related to other operations at the Yard, emission estimates for calendar years 2007 and 2010-2020 were assumed to be unchanged from the 2005 baseline year.

V. Projected Growth Rates

The emission estimates presented in Table 1 account for the expected growth in operations at UPRR's California facilities. While it is not possible to accurately predict future goods movements needs, a reasonable estimate of growth was determined based on historic data. Based on a review of historic fuel use data and other historic operational factors, such as lift counts, tons of freight, etc., and discussions with CARB staff, it was determined that a long-term growth rate of 1% per year is appropriate for the Colton Yard. Detailed data, including Diesel fuel consumption, revenue ton-miles of freight, and gross ton-miles of freight, are contained in Appendix B.

VI. Mitigation Measures

1. Current Mitigation Measures

As shown in Table 1, DPM emissions have been reduced from the 2005 baseline year. These reductions were achieved through the implementation of the measures listed below.

- Retrofit of idle control devices – By June 2008, 100% of UPRR's intrastate locomotives are equipped with idle control devices.
- Use of idle control devices on new locomotives – All new locomotives purchased since 2001 are equipped with factory-installed automatic idle control devices.
- Increased fuel efficiency – Aggressive fuel consumption efforts have achieved a 12% improvement in fuel efficiency since 1995.
- Cleaner new line haul locomotives – UPRR has acquired more than 800 new, cleaner Tier 2 line haul locomotives since they were introduced in 2005.
- Cleaner existing line haul locomotives – UPRR has remanufactured more than 1,800 older line haul locomotives with new, lower emitting components since 2000.
- Cleaner switch locomotives – ULEL switchers have been introduced—there are currently 11 ULELs operating at Colton and additional 49 ULELs operating at UPRR facilities throughout California.
- Cleaner fuels – Only Ultra-Low Sulfur Diesel (ULSD) fuel is being dispensed in California.

- Employee training – Aggressive employee training is being implemented to reduce unnecessary idling and ensure trains are operated in the most efficient manner by the locomotive engineers, thereby reducing fuel consumption and emissions.

2. Proposed Future Mitigation Measures

To achieve additional DPM reductions, UPRR proposes to implement the mitigation measures outlined below.

- Continued acquisition of Tier 2 line haul locomotives and newer technology locomotives as they become available.
- Continued remanufacture and retrofit of older line haul locomotives with new, lower-emitting components and automatic idle controls.
- Continued retirement of older locomotives from the fleet.
- Continued reductions in unnecessary locomotive and equipment idling through employee training.

VII. Evaluation of Additional Mitigation Measures

In addition to the proposed mitigation measures discussed above, UPRR will evaluate the use of other mitigation measures, on a case-by-case basis. Measures that are found to be safe, legal, technologically and operationally feasible, and cost-effective will be further evaluated for implementation.

VIII. Mechanisms for Tracking Progress

UPRR will track the progress and effectiveness of the mitigation measures using a variety of methods. Mechanisms for tracking progress could include, but are not limited to, the following:

- Recordkeeping – UPRR maintains detailed records of Diesel fuel usage. A reduction in the amount of fuel used corresponds to a reduction in emissions.
- Compliance with Other Agreements – By demonstrating compliance with the 1998 MOU, which requires locomotives operating in the South Coast Air Basin to meet a Tier 2 equivalent, emission reductions at the Colton Yard can be shown.
- Inventory Updates – Periodic updates to the emission inventory can be used to demonstrate actual emission reductions achieved at the Colton Yard. Due to the

time and data required to prepare a complete rail yard inventory, UPRR is proposing to prepare inventory updates no more frequently than once every two years.

IX. Conclusions

As shown in Table 1, the proposed mitigation measures, when fully implemented, will reduce the DPM emissions from the Colton Yard by approximately 42% from 2005 levels. These emission reductions will concurrently lower any existing predicted health risk associated with the facility operations. Other federal, state, and related air pollution control measures and plans will supplement the current and future emission reduction discussed in this Plan.

X. References

CARB, 2008. *Health Risk Assessment for the Union Pacific Railroad Colton Rail Yard.* (Available at http://www.arb.ca.gov/railyard/hra/up_col_hra.pdf.)

EPA, 2008. *Regulatory Impact Analysis: Control of Emissions of Air Pollution from Locomotive Engines and Marine Compression-Ignition Engines Less than 30 Liters per Cylinder*, EPA420-R-08-001a, USEPA-OTAQ, May 2008.

Sierra Research, 2007. *Toxic Air Contaminant Emission Inventory and Dispersion Modeling Report for the Colton Rail Yard, Bloomington, California.* (Available at http://www.arb.ca.gov/railyard/hra/sr_col_rpt.pdf.)

Appendix A

Detailed Emission Calculations

Locomotive Data

West Colton Locomotive Emissions (DPM TPY)

	2005*	2007*	2010**	2015**	2020**
Line Haul	3.6	3.4	3.3	2.6	1.9
Switch	10.0	9.9	7.7	7.3	6.6
Service and load tests	2.6	2.5	1.8	1.2	0.8
Total	16.3	15.8	12.8	11.1	9.3

* Actual

** Forecast assuming 1% p.a. growth after 2007, UPRR-projected fleet turnover, and new EPA emission standards.

Emission Calculations

Initial calculations:

2005 and 2007 from actual data

2012 based on 2005 activity and projected 2012 fleet composition without EPA (2004) controls

	2005	2007	2012 fleet @ '05 activity
Through trains and power	0.51	0.70	0.61
Freight and power in yard	3.13	2.68	2.58
Yardops	10.01	9.94	7.76
Service and load tests	2.63	2.48	1.45
Total	16.30	15.79	12.40

Growth factor calculations

2007 observed growth v. 2005	1.015
Annual growth after 2007	1.01
Growth factors	
2012 relative to 2005	1.067
2015 relative to 2012	1.030
2020 relative to 2012	1.083

Projected and interpolated emissions with growth, but without EPA (2004) controls

	2005	2007	2010	2012
Through trains and power	0.51	0.70	0.67	0.65
Freight and power in yard	3.13	2.68	2.72	2.75
Yardops	10.01	9.94	8.11	8.28
Service and load tests	2.63	2.48	1.86	1.54
Total	16.30	15.79	13.37	13.23

Control factor calculations from EPA 2008 Final RIA (Tables 3-72 and 3-82)

	2010 Base	2010 Control	2012 Base	2012 Control	2015 Control	2020 Control
EPA Line Haul Emissions	22300	21580	21956	19597	16928	12550
EPA Switcher Emissions	2051	1959	2094	1928	1883	1744
(assumes 1.6%/year growth in fuel use)						

Control factors (2015 and 2020 calculated relative to 2012 fleet)

	2010	2012	2015	2020
Line Haul Control Factor	0.968	0.893	0.824	0.564
Switcher Control Factors	0.955	0.921	0.931	0.797

RESULTS:

Projected and interpolated emissions with growth and control

	2005	2007	2010	2012	2015	2020
Through trains and power	0.51	0.70	0.65	0.58	0.50	0.36
Freight and power in yard	3.13	2.68	2.63	2.46	2.08	1.50
Yardops	10.01	9.94	7.75	7.62	7.31	6.57
Service and load tests	2.63	2.48	1.80	1.38	1.17	0.84
Total	16.30	15.79	12.84	12.04	11.06	9.27

**Locomotive Data
2007 Sample Calculations**

Activity Types

Description	Activity Code	Number of Events/Year	Locomotives per Consist	Factor Group	Emission Locomotives per Consist Working	Fraction of Calif. Fuel
Thru EB	1	439	3.357	1	3.357	0.5
Thru EB Setouts	2	21	3.357	1	3.357	0.5
Thru WB	3	6685	3.113	1	3.113	0.5
Thru WB Setouts	4	173	3.113	1	3.113	0.5
Freight Train EB Arrivals	5	904	3.421	3	3.421	0
Freight Train EB Departures	6	3712	4.404	2	4.404	0.9
Freight Train WB Arrivals	7	4096	4.240	2	4.240	0
Freight Train WB Departures	8	1123	2.832	3	2.832	0.9
Local Train EB Arrivals	9	1234	3.112	3	3.112	1
Local Train EB Departures	10	15	4.533	3	4.533	1
Local Train WB Arrivals	11	332	3.027	3	3.027	1
Local Train WB Departures	12	1630	2.855	3	2.855	1
Power Moves Thru EB Arrivals	13	13	4.615	1	1.500	0.5
Power Moves Thru EB Departures	14	13	4.615	1	1.500	0.5
Power Moves Thru WB Arrivals	15	274	3.580	1	1.500	0.5
Power Moves Thru WB Departures	16	274	3.580	1	1.500	0.5
Power Moves EB Arrivals	17	264	3.089	4	1.500	0
Power Moves EB Departures	18	322	3.261	4	1.500	0.9
Power Moves WB Arrivals	19	613	3.247	4	1.500	0
Power Moves WB Departures	20	734	3.831	4	1.500	0.9
Hump Set Return to Receiving Yard West End	21	7409	3.000	6	3.000	1
Hump Set Push Notch 2	22	1482	3.000	6	3.000	1
Hump Set Push DB	23	8150	3.000	6	3.000	1
Trim Sets	24	25562	2.000	5	2.000	1
Consist Movements in Service Track	25	4779	3.798	7	1.500	0.9
Crew Changes on EB Thru	26	43	3.357	1	3.357	0.5
Crew Changes on WB Thru	27	5801	3.113	1	3.113	0.5
Service-Shop Movements	28	1580	3.500	7	1.000	0.9

Consist Groups	Group ID	Emission Factors Weighted by Model/Tier/ZTR Fractions - DPM g/hr per Locomotive										
		Idle-NonZTR	Idle-All	DB	N1	N2	N3	N4	N5	N6	N7	N8
California Fuel (4.8 ppm S)												
Thru Trains and Power Moves	1	12.64	24.06	41.66	44.78	95.78	221.73	286.01	362.96	567.83	668.25	747.04
Freight Train WB Arrival and EB Departure	2	14.34	23.29	48.71	50.59	112.97	232.16	289.63	356.44	505.38	590.99	681.76
Freight Train EB Arrival, WB Departure and Locals	3	29.01	35.83	68.06	41.46	120.03	238.18	263.67	329.30	533.51	691.34	824.96
Power Moves In Yard	4	25.54	31.92	59.41	44.46	109.63	230.83	274.58	351.69	546.52	687.07	811.36
Trim Sets	5	47.94	47.94	80.04	35.70	134.30	210.81	226.28	286.07	483.62	579.93	744.38
Hump Sets	6	44.63	44.63	77.36	34.13	126.20	198.27	212.71	266.48	444.22	526.77	679.93
Service Movements	7	22.47	31.66	60.36	45.22	114.83	229.88	271.12	341.92	519.85	636.90	756.84
47-State Fuel (1328 ppm S)												
Thru Trains and Power Moves	1	12.64	24.06	41.66	44.78	95.78	231.93	303.63	388.80	605.26	710.37	796.31
Freight Train WB Arrival and EB Departure	2	14.34	23.29	48.71	50.59	112.97	244.81	307.22	380.56	540.06	637.05	737.23
Freight Train EB Arrival, WB Departure and Locals	3	29.01	35.83	68.06	41.46	120.03	246.38	280.20	354.40	567.07	724.01	864.79
Power Moves In Yard	4	25.54	31.92	59.41	44.46	109.63	240.30	291.62	377.46	581.89	725.63	858.15
Trim Sets	5	N/A -- Hump and trim sets operate on 100% California Fuel										
Hump Sets	6	N/A -- Hump and trim sets operate on 100% California Fuel										
Service Movements	7	22.47	31.66	60.36	45.22	114.83	239.94	287.87	366.54	553.92	675.51	803.88

Note: Idle-NonZTR is the average per-locomotive idle emission rate for the fraction of locomotives not equipped with ZTR/Auto start-stop technology

Locomotive Model Distributions

Thru Trains and Power Moves

Technology	ZTR/AESS	Switcher	GP-3x	GP-4x	SD-50	GP-60	SD-7x	SD-90	Dash 7	Dash 8	Dash 9	C-60
Pre Tier 0	No	0.0000	0.0003	0.0573	0.0021	0.0273	0.0031	0.0011	0.0000	0.0149	0.0426	0.0000
Pre Tier 0	Yes	0.0000	0.0002	0.0000	0.0000	0.0004	0.0000	0.0000	0.0000	0.0000	0.0076	0.0000
Tier 0	No	0.0000	0.0000	0.0039	0.0000	0.0352	0.2552	0.0019	0.0000	0.0087	0.0351	0.0003
Tier 0	Yes	0.0000	0.0002	0.0000	0.0000	0.0005	0.0016	0.0001	0.0000	0.0000	0.0068	0.0000
Tier 1	No	0.0000	0.0000	0.0000	0.0000	0.0000	0.0027	0.0000	0.0000	0.0000	0.0000	0.0000
Tier 1	Yes	0.0000	0.0000	0.0000	0.0000	0.0000	0.2431	0.0000	0.0000	0.0000	0.0048	0.0000
Tier 2	No	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0010	0.0000
Tier 2	Yes	0.0000	0.0000	0.0015	0.0000	0.0000	0.1061	0.0000	0.0000	0.0000	0.1344	0.0000

Freight Train WB Arrival and EB Departure

Technology	ZTR/AESS	Switcher	GP-3x	GP-4x	SD-50	GP-60	SD-7x	SD-90	Dash 7	Dash 8	Dash 9	C-60
Pre Tier 0	No	0.0000	0.0005	0.0874	0.0012	0.0740	0.0011	0.0015	0.0001	0.0117	0.0348	0.0000
Pre Tier 0	Yes	0.0000	0.0003	0.0001	0.0000	0.0001	0.0000	0.0000	0.0000	0.0000	0.0063	0.0000
Tier 0	No	0.0000	0.0000	0.0090	0.0000	0.0491	0.1414	0.0020	0.0000	0.0086	0.0230	0.0002
Tier 0	Yes	0.0000	0.0001	0.0002	0.0000	0.0014	0.0007	0.0003	0.0000	0.0000	0.0043	0.0000
Tier 1	No	0.0000	0.0000	0.0000	0.0000	0.0000	0.0013	0.0000	0.0000	0.0000	0.0000	0.0000
Tier 1	Yes	0.0000	0.0000	0.0000	0.0000	0.0000	0.1404	0.0000	0.0000	0.0000	0.0106	0.0000
Tier 2	No	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0017	0.0000
Tier 2	Yes	0.0000	0.0000	0.0009	0.0000	0.0000	0.0729	0.0000	0.0000	0.0000	0.3131	0.0000

Freight Train EB Arrival, WB Departure and Locals

Technology	ZTR/AESS	Switcher	GP-3x	GP-4x	SD-50	GP-60	SD-7x	SD-90	Dash 7	Dash 8	Dash 9	C-60
Pre Tier 0	No	0.0008	0.0143	0.1935	0.0004	0.2907	0.0000	0.0005	0.0000	0.0014	0.0037	0.0000
Pre Tier 0	Yes	0.0010	0.0052	0.0002	0.0000	0.0003	0.0000	0.0000	0.0000	0.0000	0.0006	0.0000
Tier 0	No	0.0000	0.0008	0.0111	0.0000	0.1787	0.0117	0.0012	0.0000	0.0014	0.0055	0.0001
Tier 0	Yes	0.0000	0.0044	0.0004	0.0000	0.0106	0.0001	0.0000	0.0000	0.0000	0.0007	0.0000
Tier 1	No	0.0000	0.0000	0.0000	0.0000	0.0000	0.0001	0.0000	0.0000	0.0000	0.0000	0.0000
Tier 1	Yes	0.0000	0.0000	0.0000	0.0000	0.0000	0.0111	0.0000	0.0000	0.0000	0.0021	0.0000
Tier 2	No	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0002	0.0000
Tier 2	Yes	0.0000	0.0000	0.0028	0.0000	0.0000	0.2237	0.0000	0.0000	0.0000	0.0208	0.0000

Power Moves In Yard

Technology	ZTR/AESS	Switcher	GP-3x	GP-4x	SD-50	GP-60	SD-7x	SD-90	Dash 7	Dash 8	Dash 9	C-60
Pre Tier 0	No	0.0002	0.0019	0.1573	0.0042	0.1948	0.0005	0.0012	0.0000	0.0167	0.0186	0.0000
Pre Tier 0	Yes	0.0005	0.0030	0.0002	0.0000	0.0017	0.0000	0.0000	0.0000	0.0000	0.0044	0.0000
Tier 0	No	0.0000	0.0000	0.0142	0.0000	0.1617	0.0992	0.0024	0.0000	0.0149	0.0223	0.0002
Tier 0	Yes	0.0000	0.0005	0.0003	0.0000	0.0090	0.0002	0.0002	0.0000	0.0000	0.0044	0.0000
Tier 1	No	0.0000	0.0000	0.0000	0.0000	0.0000	0.0008	0.0000	0.0000	0.0000	0.0002	0.0000
Tier 1	Yes	0.0000	0.0000	0.0000	0.0000	0.0000	0.0927	0.0000	0.0000	0.0000	0.0061	0.0000
Tier 2	No	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0010	0.0000
Tier 2	Yes	0.0000	0.0000	0.0029	0.0000	0.0000	0.0857	0.0000	0.0000	0.0000	0.0763	0.0000

Trim Sets

Technology	ZTR/AESS	Switcher	GP-3x	GP-4x	SD-50	GP-60	SD-7x	SD-90	Dash 7	Dash 8	Dash 9	C-60
Pre Tier 0	No	0.0000	0.0000	1.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Pre Tier 0	Yes	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Tier 0	No	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Tier 0	Yes	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Tier 1	No	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Tier 1	Yes	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Tier 2	No	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Tier 2	Yes	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Hump Sets													
Technology	ZTR/AESS	Switcher	GP-3x	GP-4x	SD-50	GP-60	SD-7x	SD-90	Dash 7	Dash 8	Dash 9	C-60	
Pre Tier 0	No	0.0000	0.3333	0.6667	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	
Pre Tier 0	Yes	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	
Tier 0	No	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	
Tier 0	Yes	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	
Tier 1	No	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	
Tier 1	Yes	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	
Tier 2	No	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	
Tier 2	Yes	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	

Track Segment	Segment Number	Length (mi)
Main Line 1	1	2.224
Main Line 2	2	0.136
Main Line 3	3	1.822
Main Line 4	4	0.363
Main Line 5	5	0.173
Main Line 6	6	0.332
Main Line 7	7	0.120
Main Line 8	8	0.352
Receiving Yard West End Entrance	11	0.117
Receiving Yard West End	12	0.467
Receiving Yard Middle	13	0.934
Receiving Yard East End	14	0.467
Receiving Yard East End Entrance	15	0.241
Receiving Yard to Hump	16	0.363
Hump to Service 1	17	0.221
Hump to Service 2	18	0.113
Hump to Service 3	19	0.315
Hump to Service 4	20	0.075
Service Track Entrance	21	0.204
Service Track	22	0.246
Service Track East End	23	0.063
Service Track to Ready Track East 1	24	0.076
Service Track to Ready Track East 2	25	0.053
Ready Track East	26	0.154
Ready Track West	27	0.154
Ready Track West Entrance	28	0.087
Service Track Wye East Entrance	31	0.087
Service Track Wye East Leg	32	0.065
Service Track Wye South Lead	33	0.073
Service Track Wye West Leg	34	0.068
Service Track Wye North Leg	35	0.058
Service Track Wye West Entrance	36	0.114
Service Track to Departure Yard	41	0.244
Departure Yard South - Middle	42	0.326
Departure Yard South - East End	43	0.238
Departure Yard South - East Entrance	44	0.209
Bowl to Departure Yard South	45	0.224
Departure Yard North - West End	46	0.252
Departure Yard North - Middle	47	0.252
Departure Yard North - East End	48	0.291
Departure Yard North - East Entrance	49	0.205
Bowl North 1	51	0.222
Bowl North 2	52	0.230
Bowl North 3	53	0.686
Bowl South 1	54	0.160
Bowl South 2	55	0.331
Bowl South 3	56	0.658
Main Line Leg to Palmdale 1	61	0.057
Main Line Leg to Palmdale 2	62	0.040
Main Line Leg to Palmdale 3	63	0.045
Main Line Leg to Palmdale 4	64	0.050
Cedar (Crew Change Location)	71	0.172
Service to Shop Segment 1	72	0.021
Service to Shop Segment 2	73	0.054
Service to Shop Segment 3	74	0.079
Service to Shop Segment 4	75	0.129

* Note: Approximately 5% of consists for south bound trains use the "Y" to turn to be facing south

Movement Type	Activity Code	Segment Number	Speed (mph)	Duty Cycle Number	Non-ZTR Idle Time (hrs)	ZTR Idle Time (hrs)	Fraction of Segment or Time Moving	
EB Through Trains	1	1	20	1	0.000	0.000	1.000	
"	1	2	20	1	0.000	0.000	1.000	
"	1	3	20	1	0.000	0.000	1.000	
"	1	4	20	1	0.000	0.000	1.000	
"	1	5	20	1	0.000	0.000	1.000	
"	1	6	20	1	0.000	0.000	1.000	
"	1	7	20	1	0.000	0.000	1.000	
"	1	8	20	1	0.000	0.000	1.000	
EB Through Trains with Setouts	2	11	10	2	0.000	0.000	1.000	
"	2	12	10	2	0.000	0.000	1.000	
"	2	13	10	2	0.000	0.000	1.000	
"	2	14	10	2	0.000	0.500	1.000	
"	2	15	10	2	0.000	0.000	1.000	
"	2	16	10	2	0.000	0.000	1.000	
"	2	51	10	2	0.000	0.000	1.000	
"	2	52	10	2	0.000	0.000	1.000	
"	2	53	10	2	0.000	0.000	1.000	
"	2	46	10	2	0.000	0.000	1.000	
"	2	47	10	2	0.000	0.000	1.000	
"	2	48	10	2	0.000	0.000	1.000	
"	2	49	10	2	0.000	0.000	1.000	
"	2	6	10	2	0.000	0.000	1.000	
"	2	7	10	2	0.000	0.000	1.000	
"	2	8	10	2	0.000	0.000	1.000	
WB Through Trains	3	1	20	1	0.000	0.000	1.000	
"	3	2	20	1	0.000	0.000	1.000	
"	3	3	20	1	0.000	0.000	1.000	
"	3	4	20	1	0.000	0.000	1.000	
"	3	5	20	1	0.000	0.000	1.000	
"	3	6	20	1	0.000	0.000	1.000	
"	3	7	20	1	0.000	0.000	1.000	
"	3	8	20	1	0.000	0.000	1.000	
WB Through Trains with Setouts	4	11	10	2	0.000	0.000	1.000	
"	4	12	10	2	0.000	0.500	1.000	
"	4	13	10	2	0.000	0.000	1.000	
"	4	14	10	2	0.000	0.000	1.000	
"	4	15	10	2	0.000	0.000	1.000	
"	4	16	10	2	0.000	0.000	1.000	
"	4	51	10	2	0.000	0.000	1.000	
"	4	52	10	2	0.000	0.000	1.000	
"	4	53	10	2	0.000	0.000	1.000	
"	4	46	10	2	0.000	0.000	1.000	
"	4	47	10	2	0.000	0.000	1.000	
"	4	48	10	2	0.000	0.000	1.000	
"	4	49	10	2	0.000	0.000	1.000	
"	4	6	10	2	0.000	0.000	1.000	
"	4	7	10	2	0.000	0.000	1.000	
"	4	8	10	2	0.000	0.000	1.000	
EB Arriving Freight Trains	5	11	10	2	0.000	0.000	1.000	
"	5	12	10	2	0.000	0.000	1.000	
"	5	13	10	2	0.000	0.000	1.000	
"	5	14	10	2	0.000	0.125	1.000	
"	5	-15	10	2	0.000	0.000	1.000	
"	5	-16	10	2	0.000	0.000	1.000	
"	5	-17	10	2	0.000	0.000	1.000	
"	5	-18	10	2	0.000	0.000	1.000	
"	5	-19	10	2	0.000	0.000	1.000	
"	5	-20	10	2	0.000	0.000	1.000	
"	5	-21	10	2	0.000	0.000	1.000	
EB Departing Freight Trains	6	-26	10	2	0.000	0.000	1.000	
"	6	-25	10	2	0.000	0.000	1.000	
"	6	-24	10	2	0.000	0.000	1.000	
"	6	-41	10	2	0.000	0.000	1.000	
"	6	-42	10	2	0.000	0.000	1.000	
"	6	-43	10	2	0.000	0.000	1.000	
"	6	-44	10	2	0.000	0.000	1.000	
"	6	-44	10	2	0.000	0.000	0.500	

Movement Type	Activity Code	Segment Number	Speed (mph)	Duty Cycle Number	Non-ZTR Idle Time (hrs)	ZTR Idle Time (hrs)	Fraction of Segment or Time Moving	
"	6	43	10	2	0.250	0.250	0.250	0.250
"	6	-44	10	2	0.000	0.000	0.000	0.500
"	6	49	10	2	0.250	0.250	0.250	0.500
"	6	48	10	2	0.000	0.000	0.000	0.250
"	6	49	10	2	0.000	0.000	0.000	0.500
"	6	6	10	2	0.000	0.000	0.000	1.000
"	6	7	10	2	0.000	0.000	0.000	1.000
"	6	8	10	2	0.000	0.000	0.000	0.700
"	6	61	10	2	0.000	0.000	0.000	0.300
"	6	62	10	2	0.000	0.000	0.000	0.300
"	6	63	10	2	0.000	0.000	0.000	0.300
"	6	64	10	2	0.000	0.000	0.000	0.300
WB Arriving Freight Trains	7	8	10	2	0.000	0.000	0.000	0.750
"	7	64	10	2	0.000	0.000	0.000	0.250
"	7	63	10	2	0.000	0.000	0.000	0.250
"	7	62	10	2	0.000	0.000	0.000	0.250
"	7	61	10	2	0.000	0.000	0.000	0.250
"	7	7	10	2	0.000	0.000	0.000	1.000
"	7	6	10	2	0.000	0.000	0.000	1.000
"	7	49	10	2	0.000	0.000	0.000	1.000
"	7	48	10	2	0.000	0.000	0.000	1.000
"	7	47	10	2	0.000	0.000	0.000	1.000
"	7	46	10	2	0.000	0.000	0.000	1.000
"	7	53	10	2	0.000	0.000	0.000	1.000
"	7	52	10	2	0.000	0.000	0.000	1.000
"	7	51	10	2	0.000	0.000	0.000	1.000
"	7	16	10	2	0.000	0.000	0.000	1.000
"	7	15	10	2	0.000	0.000	0.000	1.000
"	7	14	10	2	0.000	0.000	0.000	1.000
"	7	13	10	2	0.000	0.000	0.000	1.000
"	7	12	10	2	0.000	0.000	0.125	1.000
"	7	-11	10	2	0.000	0.000	0.000	1.000
"	7	-12	10	2	0.000	0.000	0.000	1.000
"	7	-13	10	2	0.000	0.000	0.000	1.000
"	7	-14	10	2	0.000	0.000	0.000	1.000
"	7	-15	10	2	0.000	0.000	0.000	1.000
"	7	-16	10	2	0.000	0.000	0.000	1.000
"	7	-17	10	2	0.000	0.000	0.000	1.000
"	7	-18	10	2	0.000	0.000	0.000	1.000
"	7	-19	10	2	0.000	0.000	0.000	1.000
"	7	-20	10	2	0.000	0.000	0.000	1.000
"	7	-21	10	2	0.000	0.000	0.000	1.000
WB Departing Freight Trains	8	-27	10	2	0.000	0.000	0.000	1.000
"	8	-26	10	2	0.000	0.000	0.000	1.000
"	8	-25	10	2	0.000	0.000	0.000	1.000
"	8	-24	10	2	0.000	0.000	0.000	1.000
"	8	-41	10	2	0.000	0.000	0.000	1.000
"	8	-45	10	2	0.000	0.000	0.000	1.000
"	8	46	10	2	0.500	0.500	0.500	0.500
"	8	53	10	2	0.000	0.000	0.000	1.000
"	8	52	10	2	0.000	0.000	0.000	1.000
"	8	51	10	2	0.000	0.000	0.000	1.000
"	8	16	10	2	0.000	0.000	0.000	1.000
"	8	15	10	2	0.000	0.000	0.000	1.000
"	8	14	10	2	0.000	0.000	0.000	1.000
"	8	13	10	2	0.000	0.000	0.000	1.000
"	8	12	10	2	0.000	0.000	0.000	1.000
"	8	11	10	2	0.000	0.000	0.000	1.000
EB Arriving Local Trains	9	11	10	2	0.000	0.000	0.000	1.000
"	9	12	10	2	0.000	0.000	0.000	1.000
"	9	13	10	2	0.000	0.000	0.000	1.000
"	9	14	10	2	0.000	0.125	0.125	1.000
"	9	-15	10	2	0.000	0.000	0.000	1.000
"	9	-16	10	2	0.000	0.000	0.000	1.000
"	9	-17	10	2	0.000	0.000	0.000	1.000
"	9	-18	10	2	0.000	0.000	0.000	1.000
"	9	-19	10	2	0.000	0.000	0.000	1.000

Movement Type	Activity Code	Segment Number	Speed (mph)	Duty Cycle Number	Non-ZTR Idle Time (hrs)	ZTR Idle Time (hrs)	Fraction of Segment or Time Moving
"	9	-20	10	2	0.000	0.000	1.000
"	9	-21	10	2	0.000	0.000	1.000
EB Departing Local Trains	10	-26	10	2	0.000	0.000	1.000
"	10	-25	10	2	0.000	0.000	1.000
"	10	-24	10	2	0.000	0.000	1.000
"	10	-41	10	2	0.000	0.000	1.000
"	10	-42	10	2	0.000	0.000	1.000
"	10	-43	10	2	0.000	0.000	1.000
"	10	-44	10	2	0.000	0.000	1.000
"	10	-44	10	2	0.000	0.000	0.500
"	10	43	10	2	0.250	0.250	0.250
"	10	-44	10	2	0.000	0.000	0.500
"	10	49	10	2	0.250	0.250	0.500
"	10	48	10	2	0.000	0.000	0.250
"	10	49	10	2	0.000	0.000	0.500
"	10	6	10	2	0.000	0.000	1.000
"	10	7	10	2	0.000	0.000	1.000
"	10	8	10	2	0.000	0.000	1.000
WB Arriving Local Trains	11	8	10	2	0.000	0.000	1.000
"	11	7	10	2	0.000	0.000	1.000
"	11	6	10	2	0.000	0.000	1.000
"	11	49	10	2	0.000	0.000	1.000
"	11	48	10	2	0.000	0.000	1.000
"	11	47	10	2	0.000	0.000	1.000
"	11	46	10	2	0.000	0.000	1.000
"	11	53	10	2	0.000	0.000	1.000
"	11	52	10	2	0.000	0.000	1.000
"	11	51	10	2	0.000	0.000	1.000
"	11	16	10	2	0.000	0.000	1.000
"	11	15	10	2	0.000	0.000	1.000
"	11	14	10	2	0.000	0.000	1.000
"	11	13	10	2	0.000	0.000	1.000
"	11	12	10	2	0.000	0.125	1.000
"	11	-11	10	2	0.000	0.000	1.000
"	11	-12	10	2	0.000	0.000	1.000
"	11	-13	10	2	0.000	0.000	1.000
"	11	-14	10	2	0.000	0.000	1.000
"	11	-15	10	2	0.000	0.000	1.000
"	11	-16	10	2	0.000	0.000	1.000
"	11	-17	10	2	0.000	0.000	1.000
"	11	-18	10	2	0.000	0.000	1.000
"	11	-19	10	2	0.000	0.000	1.000
"	11	-20	10	2	0.000	0.000	1.000
"	11	-21	10	2	0.000	0.000	1.000
WB Departing Local Trains	12	-27	10	2	0.000	0.000	1.000
"	12	-26	10	2	0.000	0.000	1.000
"	12	-25	10	2	0.000	0.000	1.000
"	12	-24	10	2	0.000	0.000	1.000
"	12	-41	10	2	0.000	0.000	1.000
"	12	-45	10	2	0.000	0.000	1.000
"	12	46	10	2	0.500	0.500	0.500
"	12	53	10	2	0.000	0.000	1.000
"	12	52	10	2	0.000	0.000	1.000
"	12	51	10	2	0.000	0.000	1.000
"	12	16	10	2	0.000	0.000	1.000
"	12	15	10	2	0.000	0.000	1.000
"	12	14	10	2	0.000	0.000	1.000
"	12	13	10	2	0.000	0.000	1.000
"	12	12	10	2	0.000	0.000	1.000
"	12	11	10	2	0.000	0.000	1.000
EB Power Moves Thru	13	-1	20	1	0.000	0.000	1.000
"	13	-2	20	1	0.000	0.000	1.000
"	13	-3	20	1	0.000	0.000	1.000
"	13	-4	20	1	0.000	0.000	1.000
"	13	-5	20	1	0.000	0.000	1.000
"	13	-6	20	1	0.000	0.000	1.000
"	13	-7	20	1	0.000	0.000	1.000

Movement Type	Activity Code	Segment Number	Speed (mph)	Duty Cycle Number	Non-ZTR Idle Time (hrs)	ZTR Idle Time (hrs)	Fraction of Segment or Time Moving
"	13	-8	20	1	0.000	0.000	1.000
WB Power Moves Thru	15	-1	20	1	0.000	0.000	1.000
"	15	-2	20	1	0.000	0.000	1.000
"	15	-3	20	1	0.000	0.000	1.000
"	15	-4	20	1	0.000	0.000	1.000
"	15	-5	20	1	0.000	0.000	1.000
"	15	-6	20	1	0.000	0.000	1.000
"	15	-7	20	1	0.000	0.000	1.000
"	15	-8	20	1	0.000	0.000	1.000
EB Power Moves Arriving	17	-11	10	2	0.000	0.000	1.000
"	17	-12	10	2	0.000	0.000	1.000
"	17	-13	10	2	0.000	0.000	1.000
"	17	-14	10	2	0.000	0.000	1.000
"	17	-15	10	2	0.000	0.000	1.000
"	17	-16	10	2	0.000	0.000	1.000
"	17	-17	10	2	0.000	0.000	1.000
"	17	-18	10	2	0.000	0.000	1.000
"	17	-19	10	2	0.000	0.000	1.000
"	17	-20	10	2	0.000	0.000	1.000
"	17	-21	10	2	0.000	0.000	1.000
EB Power Moves Departing	18	-26	10	2	0.000	0.000	1.000
"	18	-25	10	2	0.000	0.000	1.000
"	18	-24	10	2	0.000	0.000	1.000
"	18	-41	10	2	0.000	0.000	1.000
"	18	-42	10	2	0.000	0.000	1.000
"	18	-43	10	2	0.000	0.000	1.000
"	18	-44	10	2	0.000	0.000	1.000
"	18	-6	10	2	0.000	0.000	1.000
"	18	-7	10	2	0.000	0.000	1.000
"	18	-8	10	2	0.000	0.000	1.000
WB Power Moves Arriving	19	-8	10	2	0.000	0.000	1.000
"	19	-7	10	2	0.000	0.000	1.000
"	19	-6	10	2	0.000	0.000	1.000
"	19	-44	10	2	0.000	0.000	1.000
"	19	-43	10	2	0.000	0.000	1.000
"	19	-42	10	2	0.000	0.000	1.000
"	19	-41	10	2	0.000	0.000	1.000
"	19	-24	10	2	0.000	0.000	1.000
"	19	-25	10	2	0.000	0.000	1.000
"	19	-26	10	2	0.000	0.000	1.000
"	19	-27	10	2	0.000	0.000	1.000
"	19	-28	10	2	0.000	0.000	1.000
"	19	-21	10	2	0.000	0.000	1.000
WB Power Moves Departing	20	-27	10	2	0.000	0.000	1.000
"	20	-28	10	2	0.000	0.000	1.000
"	20	-20	10	2	0.000	0.000	1.000
"	20	-19	10	2	0.000	0.000	1.000
"	20	-18	10	2	0.000	0.000	1.000
"	20	-17	10	2	0.000	0.000	1.000
"	20	-16	10	2	0.000	0.000	1.000
"	20	-15	10	2	0.000	0.000	1.000
"	20	-14	10	2	0.000	0.000	1.000
"	20	-13	10	2	0.000	0.000	1.000
"	20	-12	10	2	0.000	0.000	1.000
"	20	-11	10	2	0.000	0.000	1.000
Consist Movements in Service and Ready Tracks	25	-22	10	2	0.000	0.000	1.000
"	25	-31	10	2	0.000	0.000	0.500
"	25	-32	10	2	0.000	0.000	0.500
"	25	-33	10	2	0.000	0.000	0.500
"	25	-34	10	2	0.000	0.000	0.500
"	25	-35	10	2	0.000	0.000	0.250
"	25	-31	10	2	0.000	0.000	0.250
"	25	-23	10	2	0.000	0.000	0.750
"	25	-24	10	2	0.000	0.000	0.750
"	25	-25	10	2	0.000	0.000	0.750
"	25	-26	10	2	0.000	0.000	0.750
"	25	-36	10	2	0.000	0.000	0.250

Movement Type	Activity Code	Segment Number	Speed (mph)	Duty Cycle Number	Non-ZTR Idle Time (hrs)	ZTR Idle Time (hrs)	Fraction of Segment or	
							Moving	Time
"	25	-21	10	2	0.000	0.000	0.250	
"	25	-28	10	2	0.000	0.000	0.250	
"	25	-27	10	2	0.000	0.000	0.250	
EB Through Train Crew Changes	26	71	10	2	0.000	0.167	0.000	
WB Through Train Crew Changes	27	71	10	2	0.000	0.167	0.000	
Service to Shop Movements and Return	28	72	10	2	0.000	0.000	1.000	
"	28	73	10	2	0.000	0.000	1.000	
"	28	74	10	2	0.000	0.000	1.000	
"	28	75	10	2	0.000	0.000	1.000	
"	28	75	10	2	0.000	0.167	1.000	
"	28	74	10	2	0.000	0.000	1.000	
"	28	73	10	2	0.000	0.000	1.000	
"	28	72	10	2	0.000	0.000	1.000	

Notes

- (1) Segment numbers listed as negative values are in-yard power moves from arriving trains to service or from service to departing trains
- (2) Non-ZTR Idling is the duration of an idle event when units without ZTR continue to idle after ZTR-equipped units have shut down
- (3) Idling All is the duration of idling during which all locomotives continue to idle
- (4) Fraction of Segment Moving is the fraction of the length of the segment over which the movement occurs or the fraction of events moving on this route
- (5) All intermodal arriving trains, including those arriving and departing, are assumed to be distributed evenly between the three parts of the intermodal yard (west, center, and east)
- (6) 50% of departing intermodal trains are assumed to depart from the Desert Yard, and the other 50% from the three parts of the intermodal yard
- (7) 50% of other trains arriving or departing are assumed to use the Desert Yard, and the other 50% use the manifest yard (both arrivals and departures)
- (8) All other trains both arriving and departing are assumed to use the manifest yard

	Activity Code	Segment Number	Duty Cycle Number	Non-ZTR Idle Time (hrs)	ZTR Idle Time (hrs)	Working Time or Fraction (hrs)
Yard Operations						
Hump Set Movement from Hump to Receiving West End	21	11	4	0.000	0.000	0.045
"	21	12	4	0.000	0.000	0.180
"	21	13	4	0.000	0.000	0.361
"	21	14	4	0.000	0.000	0.180
"	21	15	4	0.000	0.000	0.093
"	21	16	4	0.000	0.000	0.140
Hump Set Push - Notch 2	22	11	5	0.000	0.000	0.200
"	22	12	5	0.000	0.000	0.800
Hump Set Push - Dynamic Brake	23	13	6	0.000	0.000	0.466
"	23	14	6	0.000	0.000	0.233
"	23	15	6	0.000	0.000	0.120
"	23	16	6	0.000	0.000	0.181
Trim Set Operations (Yard Wide)	24	53	3	0.000	0.000	0.250
"	24	56	3	0.000	0.000	0.250
"	24	45	3	0.000	0.000	0.100
"	24	42	3	0.000	0.000	0.100
"	24	43	3	0.000	0.000	0.075
"	24	44	3	0.000	0.000	0.025
"	24	46	3	0.000	0.000	0.050
"	24	47	3	0.000	0.000	0.050
"	24	48	3	0.000	0.000	0.075
"	24	49	3	0.000	0.000	0.025

	Duty Cycle Number	Idle	DB	N1	N2	N3	N4	N5	N6	N7	N8
Duty Cycles (Percent of Time by Notch)											
Through Trains and Power Moves	1	0.0%	0.0%	0.0%	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
In Yard Movement	2	0.0%	0.0%	50.0%	50.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Trim Sets	3	59.8%	0.0%	12.4%	12.3%	5.8%	3.6%	3.6%	1.5%	0.2%	0.8%
Hump Set Movement from Hump to Receiving West End	4	10.0%	0.0%	45.0%	45.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Hump Set Push - Notch 2	5	0.0%	0.0%	0.0%	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Hump Set Push - Dynamic Brake	6	0.0%	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%

Emission Factors Weighted by Model/Tier/ZTR Fractions - DPM g/hr per Locomotive

Locomotive Model Group California Fuel (4.8 ppm S)	Group ID	Idle- NonZTR											
		Idle-All	DB	N1	N2	N3	N4	N5	N6	N7	N8		
Service	1	22.47	31.66	60.36	45.22	114.83	229.88	271.12	341.92	519.85	636.9	756.84	
LoadTest	2	23.83	32.6	61.58	45.59	112.4	227.84	270.29	346.62	526.59	640.14	761.45	
47-State Fuel (1328 ppm S)													
Service	1	22.47	31.66	60.36	45.22	114.83	239.94	287.87	366.54	553.92	675.51	803.88	
LoadTest	2	23.83	32.6	61.58	45.59	112.4	237.86	286.98	371.48	561.18	679.42	809.37	

Note: Idle-NonZTR is the average per-locomotive idle emission rate for the fraction of locomotives not equipped with ZTR/Auto start-stop technology

Service and Shop Activity

Activity	Number of Locomotives	Duration of Activity per Locomotive (minutes)											
		Fraction of Calif.		Idle- Fuel NonZTR									
		Idle- Fuel	NonZTR	Idle-All	DB	N1	N2	N3	N4	N5	N6	N7	N8
Service - Inbound & Service	18153	0.00	0	90	0	0	0	0	0	0	0	0	0
Service - Post Service	18153	0.90	60	30	0	0	0	0	0	0	0	0	0
Pre-Maintenance Load Test	948	0.90	0	2	0	0	0	0	0	0	0	0	8
Post-Maintenance Load Test	948	0.90	0	10	0	10	0	0	0	0	0	0	10
Quarterly Maintenance Load Test	851	0.90	0	2	0	0	0	0	0	0	0	0	8
Unscheduled Mtc Diagnostic Test	133	0.90	0	5	0	0	0	0	0	0	0	0	10
Unscheduled Mtc Post Test	2053	0.90	0	10	0	10	0	0	0	0	0	0	10

Locomotive Model Distributions

Locomotives Serviced

Technology	ZTR/AESS	Switcher	GP-3x	GP-4x	SD-50	GP-60	SD-7x	SD-90	Dash 7	Dash 8	Dash 9	C-60
Pre Tier 0	No	0.0014	0.0015	0.1717	0.0016	0.1588	0.0008	0.0017	0.0000	0.0112	0.0179	0.0000
Pre Tier 0	Yes	0.0029	0.0184	0.0243	0.0000	0.0129	0.0000	0.0000	0.0000	0.0000	0.0046	0.0000
Tier 0	No	0.0004	0.0004	0.0119	0.0001	0.1030	0.0820	0.0031	0.0000	0.0080	0.0216	0.0004
Tier 0	Yes	0.0021	0.0031	0.0037	0.0000	0.0090	0.0003	0.0002	0.0000	0.0000	0.0041	0.0000
Tier 1	No	0.0000	0.0000	0.0000	0.0000	0.0000	0.0008	0.0000	0.0000	0.0000	0.0001	0.0000
Tier 1	Yes	0.0000	0.0000	0.0000	0.0000	0.0000	0.0840	0.0000	0.0000	0.0000	0.0076	0.0000
Tier 2	No	0.0000	0.0000	0.0000	0.0000	0.0000	0.0002	0.0000	0.0000	0.0000	0.0012	0.0000
Tier 2	Yes	0.0000	0.0000	0.0000	0.0000	0.0000	0.0876	0.0000	0.0000	0.0000	0.1357	0.0000

Locomotives Load Tested

Technology	ZTR/AESS	Switcher	GP-3x	GP-4x	SD-50	GP-60	SD-7x	SD-90	Dash 7	Dash 8	Dash 9	C-60
Pre Tier 0	No	0.0000	0.0023	0.1559	0.0020	0.1677	0.0003	0.0023	0.0000	0.0212	0.0278	0.0000
Pre Tier 0	Yes	0.0000	0.0212	0.0278	0.0000	0.0111	0.0000	0.0000	0.0000	0.0000	0.0085	0.0000
Tier 0	No	0.0000	0.0007	0.0118	0.0000	0.0990	0.0997	0.0039	0.0000	0.0150	0.0363	0.0007
Tier 0	Yes	0.0000	0.0039	0.0056	0.0000	0.0072	0.0003	0.0000	0.0000	0.0000	0.0046	0.0000
Tier 1	No	0.0000	0.0000	0.0000	0.0000	0.0000	0.0003	0.0000	0.0000	0.0000	0.0000	0.0000
Tier 1	Yes	0.0000	0.0000	0.0000	0.0000	0.0000	0.0944	0.0000	0.0000	0.0000	0.0062	0.0000
Tier 2	No	0.0000	0.0000	0.0000	0.0000	0.0000	0.0003	0.0000	0.0000	0.0000	0.0013	0.0000
Tier 2	Yes	0.0000	0.0000	0.0000	0.0000	0.0000	0.0592	0.0000	0.0000	0.0000	0.1016	0.0000

Example 1 -- WB Arriving Freight Trains

Parameter	Value
Activity Code	7
Number of Events	4096
Locomotives per Consist on Train	4.24
Locomotives per Consist Working During Power Moves	1.5
Emission Factor Group	2
Fraction of California Fuel	0.00

Route Followed	Segment Number	Length (miles)	Speed (mph)	Power Move	Non-ZTR Idle (hrs)	ZTR Idle (hrs)	Fraction of Segment Moving	Locomotive Hours Moving	Locomotive Hours NonZTR Idle	Locomotive Hours ZTR Idle
							Moving	Hours	Hours	Idle
Main Line 8	8	0.352	10	N	0	0	0.75	458.05	0.00	0.00
Main Line Leg to Palmdale 4	64	0.050	10	N	0	0	0.25	21.66	0.00	0.00
Main Line Leg to Palmdale 3	63	0.045	10	N	0	0	0.25	19.58	0.00	0.00
Main Line Leg to Palmdale 2	62	0.040	10	N	0	0	0.25	17.51	0.00	0.00
Main Line Leg to Palmdale 1	61	0.057	10	N	0	0	0.25	24.92	0.00	0.00
Main Line 7	7	0.120	10	N	0	0	1	207.82	0.00	0.00
Main Line 6	6	0.332	10	N	0	0	1	577.09	0.00	0.00
Departure Yard North - East Entrance	49	0.205	10	N	0	0	1	356.25	0.00	0.00
Departure Yard North - East End	48	0.291	10	N	0	0	1	505.05	0.00	0.00
Departure Yard North - Middle	47	0.252	10	N	0	0	1	436.89	0.00	0.00
Departure Yard North - West End	46	0.252	10	N	0	0	1	436.89	0.00	0.00
Bowl North 3	53	0.686	10	N	0	0	1	1191.00	0.00	0.00
Bowl North 2	52	0.230	10	N	0	0	1	399.51	0.00	0.00
Bowl North 1	51	0.222	10	N	0	0	1	386.04	0.00	0.00
Receiving Yard to Hump	16	0.363	10	N	0	0	1	630.75	0.00	0.00
Receiving Yard East End Entrance	15	0.241	10	N	0	0	1	417.80	0.00	0.00
Receiving Yard East End	14	0.467	10	N	0	0	1	811.27	0.00	0.00
Receiving Yard Middle	13	0.934	10	N	0	0	1	1622.54	0.00	0.00
Receiving Yard West End	12	0.467	10	N	0	0.125	1	811.27	0.00	2170.88
Receiving Yard West End Entrance	-11	0.117	10	Y	0	0	1	203.30	0.00	0.00
Receiving Yard West End	-12	0.467	10	Y	0	0	1	811.27	0.00	0.00
Receiving Yard Middle	-13	0.934	10	Y	0	0	1	1622.54	0.00	0.00
Receiving Yard East End	-14	0.467	10	Y	0	0	1	811.27	0.00	0.00
Receiving Yard East End Entrance	-15	0.241	10	Y	0	0	1	417.80	0.00	0.00
Receiving Yard to Hump	-16	0.363	10	Y	0	0	1	630.75	0.00	0.00
Hump to Service 1	-17	0.221	10	Y	0	0	1	383.54	0.00	0.00
Hump to Service 2	-18	0.113	10	Y	0	0	1	196.24	0.00	0.00
Hump to Service 3	-19	0.315	10	Y	0	0	1	547.33	0.00	0.00
Hump to Service 4	-20	0.075	10	Y	0	0	1	130.36	0.00	0.00
Service Track Entrance	-21	0.204	10	Y	0	0	1	354.81	0.00	0.00

Note: 75% of WB arriving freight trains arrive via the Main Line East; 25% come via Palmdale

Total	15441.10	0.00	2170.88
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Emission Factors	Group ID	Idle-											
		NonZTR	Idle-All	DB	N1	N2	N3	N4	N5	N6	N7	N8	
Arriving IM Trains - CA Fuel	2	14.34	23.29	48.71	50.59	112.97	232.16	289.63	356.44	505.38	590.99	681.76	
Arriving IM Trains - 47-State Fuel	2	14.34	23.29	48.71	50.59	112.97	244.81	307.22	380.56	540.06	637.05	737.23	
CA Fuel Fraction Adjusted Rates		14.34	23.29	48.71	50.59	112.97	244.81	307.22	380.56	540.06	637.05	737.23	
Duty Cycle Moving	2	0.00	0.00	0.00	0.50	0.50	0.00	0.00	0.00	0.00	0.00	0.00	
Weighted g/hr emissions		0.00	0.00	0.00	25.30	56.49	0.00	0.00	0.00	0.00	0.00	0.00	
Emission Rate (g/hr)	Group ID	Idle-											
		Moving	NonZTR	Idle-All									
Locomotive Hours		81.78	14.34	23.29									
Total Emissions (g/yr)		15441.10	0.00	2170.88									
Total Emissions (g/yr)		1262773	0	50560									

Example 2 -- Quarterly Maintenance Load Testing

Number of Quarterly Maintenance Load Tests	851	Duration (minutes)												
Fraction of Calif. Fuel	0.9													
Emission Factors (g/hr)	Group ID	Idle-	NonZTR	Idle-All	DB	N1	N2	N3	N4	N5	N6	N7	N8	
Load Test - CA Fuel	2	23.83	32.60	61.58	45.59	112.40	227.84	270.29	346.62	526.59	640.14	761.45		
Load Test - 47-State Fuel	2	23.83	32.6	61.58	45.59	112.4	237.86	286.98	371.48	561.18	679.42	809.37		
CA Fuel Fraction Adjusted Rates		23.83	32.60	61.58	45.59	112.40	228.84	271.96	349.11	530.05	644.07	766.24		
Activity		Number of Locomotives	Idle-	NonZTR	Idle-All	DB	N1	N2	N3	N4	N5	N6	N7	N8
Quarterly Maintenance Load Test		851	0	2	0	0	0	0	0	0	0	0	0	8
Emissions (g)														
Notch-Specific		0.0	924.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	86942.9
Total Emissions (g/yr)														
		87868												

Yard Trucks

Summary of Emissions from Diesel-Fueled Yard Trucks
Colton Rail Yard

Running Exhaust Emissions

Equipment Type	Equipment ID/Owner	Vehicle ID	Vehicle Make/Model	Year	Vehicle Class	Annual VMT (miles/yr) ¹	2005 Emission Factors (g/mi) ^{2,3}						2005 Emissions (tpy)					
							ROG	CO	NOx	PM10	DPM	SOx	ROG	CO	NOx	PM10	DPM	SOx
Truck	Engineering	69496	Chevy CK 3500	1998	LDT	17,060	0.12	1.13	1.60	0.06	0.06	0.06	0.002	0.021	0.030	0.001	0.001	0.001
Truck	Engineering	69499	Chevy CK 3500	1998	LDT	20,042	0.12	1.13	1.60	0.06	0.06	0.06	0.003	0.025	0.035	0.001	0.001	0.001
Truck	Car Dept	1915-73119	Ford F-450	2003	LHDT1	5,250	0.33	1.70	6.70	0.11	0.08	0.04	0.002	0.010	0.039	0.001	0.000	0.000
Truck	Engineering	9007E	Ford F-800	1992	MHD	3,353	0.94	9.70	18.46	1.25	1.25	0.16	0.003	0.036	0.068	0.005	0.005	0.001
Truck	Engineering	9009E	Ford F-800	1992	MHD	3,053	0.94	9.70	18.46	1.25	1.25	0.16	0.003	0.033	0.062	0.004	0.004	0.001
Truck	Engineering	9031E	Ford F-800	1992	MHD	9,929	0.94	9.70	18.46	1.25	1.25	0.16	0.010	0.106	0.202	0.014	0.014	0.002
Truck	Engineering	9018E	Ford F-800	1992	MHD	10,114	0.94	9.70	18.46	1.25	1.25	0.16	0.010	0.108	0.206	0.014	0.014	0.002
Truck	Car Dept	NA	International	1987	HHD	156	12.31	41.26	31.86	5.72	5.72	0.22	0.002	0.007	0.005	0.001	0.001	0.000
Truck	Engineering	64274	Ford LT8000	1989	HHD	18,197	12.06	40.31	31.60	5.48	5.42	0.24	0.242	0.808	0.634	0.110	0.109	0.005
Truck	Car Dept	1915-9038E	Ford LT9000	1997	HHD	16,001	6.92	16.99	31.05	2.34	2.26	0.24	0.122	0.300	0.548	0.041	0.040	0.004
Total													0.40	1.45	1.83	0.19	0.19	0.02

Idling Exhaust Emissions

Equipment Type	Equipment ID/Owner	Vehicle ID	Vehicle Make/Model	Year	Vehicle Class	Idling ⁴		2005 Emission Factors (g/hr) ⁵						2005 Emissions (tpy)					
						(min/day)	(hr/yr)	ROG	CO	NOx	PM10	DPM	SOx	ROG	CO	NOx	PM10	DPM	SOx
Truck	Engineering	69496	Chevy CK 3500	1998	LDT	15	91.25	0.00	0.00	0.00	0.00	0.00	0.00	0.000	0.000	0.000	0.000	0.000	0.000
Truck	Engineering	69499	Chevy CK 3500	1998	LDT	15	91.25	0.00	0.00	0.00	0.00	0.00	0.00	0.000	0.000	0.000	0.000	0.000	0.000
Truck	Car Dept	1915-73119	Ford F-450	2003	LHDT2	15	91.25	3.17	26.30	75.05	0.75	0.75	0.34	0.000	0.003	0.008	0.000	0.000	0.000
Truck	Engineering	9007E	Ford F-800	1992	MHD	15	91.25	3.17	26.30	75.05	1.40	1.40	0.34	0.000	0.003	0.008	0.000	0.000	0.000
Truck	Engineering	9009E	Ford F-800	1992	MHD	15	91.25	3.17	26.30	75.05	1.40	1.40	0.34	0.000	0.003	0.008	0.000	0.000	0.000
Truck	Engineering	9031E	Ford F-800	1992	MHD	15	91.25	3.17	26.30	75.05	1.40	1.40	0.34	0.000	0.003	0.008	0.000	0.000	0.000
Truck	Engineering	9018E	Ford F-800	1992	MHD	15	91.25	3.17	26.30	75.05	1.40	1.40	0.34	0.000	0.003	0.008	0.000	0.000	0.000
Truck	Car Dept	NA	International	1987	HHD	15	91.25	22.84	61.55	82.94	4.28	4.28	0.55	0.002	0.006	0.008	0.000	0.000	0.000
Truck	Engineering	64274	Ford LT8000	1989	HHD	15	91.25	19.45	58.49	85.53	3.43	3.43	0.55	0.002	0.006	0.009	0.000	0.000	0.000
Truck	Car Dept	1915-9038E	Ford LT9000	1997	HHD	15	91.25	12.41	49.53	110.27	1.93	1.93	0.55	0.001	0.005	0.011	0.000	0.000	0.000
Total													0.007	0.030	0.066	0.002	0.002	0.000	

Notes:

1. Annual VMT estimated based on the vehicle age and odometer reading.
2. Running exhaust emissions calculated using the EMFAC2007 model with the BURDEN output option.
3. Running exhaust emission factor calculations assumed an average speed of 15 mph.
4. Idling time (hr/yr) is an engineering estimate based on discussions with UPRR staff.
5. Idling exhaust emissions factors calculated using the EMFAC2007 model with the EMFAC output option.

Summary of Emissions from Diesel-Fueled Yard Trucks
Colton Rail Yard

Running Exhaust Emissions

Equipment Type	Equipment ID/Owner	Vehicle ID	Vehicle Make/Model	Year	Vehicle Class	Annual VMT (miles/yr) ¹	2007 Emission Factors (g/mi) ^{2,3}						2007 Emissions (tpy)					
							ROG	CO	NOx	PM10	DPM	SOx	ROG	CO	NOx	PM10	DPM	SOx
Truck	Engineering	69496	Chevy CK 3500	1998	LDT	17,060	0.07	0.82	1.43	0.07	0.07	0.00	0.001	0.015	0.027	0.001	0.001	0.000
Truck	Engineering	69499	Chevy CK 3500	1998	LDT	20,042	0.07	0.82	1.43	0.07	0.07	0.00	0.002	0.018	0.032	0.002	0.002	0.000
Truck	Car Dept	1915-73119	Ford F-450	2003	LHDT1	5,250	0.29	1.42	5.90	0.09	0.07	0.00	0.002	0.008	0.034	0.001	0.000	0.000
Truck	Engineering	9007E	Ford F-800	1992	MHD	3,353	0.53	4.80	19.21	0.53	0.53	0.00	0.002	0.018	0.071	0.002	0.002	0.000
Truck	Engineering	9009E	Ford F-800	1992	MHD	3,053	0.53	4.80	19.21	0.53	0.53	0.00	0.002	0.016	0.065	0.002	0.002	0.000
Truck	Engineering	9031E	Ford F-800	1992	MHD	9,929	0.53	4.80	19.21	0.53	0.53	0.00	0.006	0.053	0.210	0.006	0.006	0.000
Truck	Engineering	9018E	Ford F-800	1992	MHD	10,114	0.53	4.80	19.21	0.53	0.53	0.00	0.006	0.054	0.214	0.006	0.006	0.000
Truck	Car Dept	NA	International	1987	HHD	156	6.43	36.48	26.46	4.54	4.35	0.00	0.001	0.006	0.005	0.001	0.001	0.000
Truck	Engineering	64274	Ford LT8000	1989	HHD	18,197	6.45	36.19	26.51	4.23	4.13	0.00	0.129	0.726	0.532	0.085	0.083	0.000
Truck	Car Dept	1915-9038E	Ford LT9000	1997	HHD	16,001	3.45	13.91	24.29	1.46	1.39	0.04	0.061	0.245	0.428	0.026	0.024	0.001
Total													0.21	1.16	1.62	0.13	0.13	0.00

Idling Exhaust Emissions

Equipment Type	Equipment ID/Owner	Vehicle ID	Vehicle Make/Model	Year	Vehicle Class	Idling ⁴		2007 Emission Factors (g/hr) ⁵						2007 Emissions (tpy)					
						(min/day)	(hr/yr)	ROG	CO	NOx	PM10	DPM	SOx	ROG	CO	NOx	PM10	DPM	SOx
Truck	Engineering	69496	Chevy CK 3500	1998	LDT	15	91.25	0.00	0.00	0.00	0.00	0.00	0.00	0.000	0.000	0.000	0.000	0.000	0.000
Truck	Engineering	69499	Chevy CK 3500	1998	LDT	15	91.25	0.00	0.00	0.00	0.00	0.00	0.00	0.000	0.000	0.000	0.000	0.000	0.000
Truck	Car Dept	1915-73119	Ford F-450	2003	LHDT2	15	91.25	3.17	26.30	75.05	0.72	0.72	0.04	0.000	0.003	0.008	0.000	0.000	0.000
Truck	Engineering	9007E	Ford F-800	1992	MHD	15	91.25	3.17	26.30	75.05	1.34	1.34	0.04	0.000	0.003	0.008	0.000	0.000	0.000
Truck	Engineering	9009E	Ford F-800	1992	MHD	15	91.25	3.17	26.30	75.05	1.34	1.34	0.04	0.000	0.003	0.008	0.000	0.000	0.000
Truck	Engineering	9031E	Ford F-800	1992	MHD	15	91.25	3.17	26.30	75.05	1.34	1.34	0.04	0.000	0.003	0.008	0.000	0.000	0.000
Truck	Engineering	9018E	Ford F-800	1992	MHD	15	91.25	3.17	26.30	75.05	1.34	1.34	0.04	0.000	0.003	0.008	0.000	0.000	0.000
Truck	Car Dept	NA	International	1987	HHD	15	91.25	22.84	61.55	82.94	4.12	4.12	0.06	0.002	0.006	0.008	0.000	0.000	0.000
Truck	Engineering	64274	Ford LT8000	1989	HHD	15	91.25	19.45	58.49	85.53	3.30	3.30	0.06	0.002	0.006	0.009	0.000	0.000	0.000
Truck	Car Dept	1915-9038E	Ford LT9000	1997	HHD	15	91.25	12.41	49.53	110.27	1.85	1.85	0.06	0.001	0.005	0.011	0.000	0.000	0.000
Total													0.007	0.030	0.066	0.002	0.002	0.000	

Notes:

1. The 2005 annual VMT estimated based on the vehicle age and odometer reading. Assumed no change for 2007.
2. Running exhaust emissions calculated using the EMFAC2007 model with the BURDEN output option.
3. Running exhaust emission factor calculations assumed an average speed of 15 mph.
4. Idling time (hr/yr) is an engineering estimate based on discussions with UPRR staff.
5. Idling exhaust emissions factors calculated using the EMFAC2007 model with the EMFAC output option.

Summary of Emissions from Diesel-Fueled Yard Trucks
Colton Rail Yard

Running Exhaust Emissions

Equipment Type	Equipment ID/Owner	Vehicle ID	Vehicle Make/Model	Year	Vehicle Class	Annual VMT (miles/yr) ¹	2010 Emission Factors (g/mi) ^{2,3}						2010 Emissions (tpy)					
							ROG	CO	NOx	PM10	DPM	SOx	ROG	CO	NOx	PM10	DPM	SOx
Truck	Engineering	69496	Chevy CK 3500	1998	LDT	17,060	0.08	0.80	1.43	0.08	0.08	0.00	0.001	0.015	0.027	0.001	0.001	0.000
Truck	Engineering	69499	Chevy CK 3500	1998	LDT	20,042	0.08	0.80	1.43	0.08	0.08	0.00	0.002	0.018	0.032	0.002	0.002	0.000
Truck	Car Dept	1915-73119	Ford F-450	2003	LHDT1	5,250	0.34	1.64	5.98	0.10	0.07	0.00	0.002	0.010	0.035	0.001	0.000	0.000
Truck	Engineering	9007E	Ford F-800	1992	MHD	3,353	0.79	8.28	16.57	1.18	1.18	0.00	0.003	0.031	0.061	0.004	0.004	0.000
Truck	Engineering	9009E	Ford F-800	1992	MHD	3,053	0.79	8.28	16.57	1.18	1.18	0.00	0.003	0.028	0.056	0.004	0.004	0.000
Truck	Engineering	9031E	Ford F-800	1992	MHD	9,929	0.79	8.28	16.57	1.18	1.18	0.00	0.009	0.091	0.181	0.013	0.013	0.000
Truck	Engineering	9018E	Ford F-800	1992	MHD	10,114	0.79	8.28	16.57	1.18	1.18	0.00	0.009	0.092	0.185	0.013	0.013	0.000
Truck	Car Dept	NA	International	1987	HHD	156	6.72	37.97	26.54	4.70	4.37	0.00	0.001	0.007	0.005	0.001	0.001	0.000
Truck	Engineering	64274	Ford LT8000	1989	HHD	18,197	6.80	38.56	27.04	4.54	4.36	0.00	0.136	0.773	0.542	0.091	0.087	0.000
Truck	Car Dept	1915-9038E	Ford LT9000	1997	HHD	16,001	3.90	15.84	25.06	1.64	1.54	0.00	0.069	0.279	0.442	0.029	0.027	0.000
Total													0.23	1.34	1.57	0.16	0.15	0.00

Idling Exhaust Emissions

Equipment Type	Equipment ID/Owner	Vehicle ID	Vehicle Make/Model	Year	Vehicle Class	Idling ⁴		2010 Emission Factors (g/hr) ⁵						2010 Emissions (tpy)					
						(min/day)	(hr/yr)	ROG	CO	NOx	PM10	DPM	SOx	ROG	CO	NOx	PM10	DPM	SOx
Truck	Engineering	69496	Chevy CK 3500	1998	LDT	15	91.25	0.00	0.00	0.00	0.00	0.00	0.00	0.000	0.000	0.000	0.000	0.000	0.000
Truck	Engineering	69499	Chevy CK 3500	1998	LDT	15	91.25	0.00	0.00	0.00	0.00	0.00	0.00	0.000	0.000	0.000	0.000	0.000	0.000
Truck	Car Dept	1915-73119	Ford F-450	2003	LHDT2	15	91.25	3.17	26.30	75.05	0.72	0.72	0.04	0.000	0.003	0.008	0.000	0.000	0.000
Truck	Engineering	9007E	Ford F-800	1992	MHD	15	91.25	3.17	26.30	75.05	1.34	1.34	0.04	0.000	0.003	0.008	0.000	0.000	0.000
Truck	Engineering	9009E	Ford F-800	1992	MHD	15	91.25	3.17	26.30	75.05	1.34	1.34	0.04	0.000	0.003	0.008	0.000	0.000	0.000
Truck	Engineering	9031E	Ford F-800	1992	MHD	15	91.25	3.17	26.30	75.05	1.34	1.34	0.04	0.000	0.003	0.008	0.000	0.000	0.000
Truck	Engineering	9018E	Ford F-800	1992	MHD	15	91.25	3.17	26.30	75.05	1.34	1.34	0.04	0.000	0.003	0.008	0.000	0.000	0.000
Truck	Car Dept	NA	International	1987	HHD	15	91.25	22.84	61.55	82.94	4.12	4.12	0.06	0.002	0.006	0.008	0.000	0.000	0.000
Truck	Engineering	64274	Ford LT8000	1989	HHD	15	91.25	19.45	58.49	85.53	3.30	3.30	0.06	0.002	0.006	0.009	0.000	0.000	0.000
Truck	Car Dept	1915-9038E	Ford LT9000	1997	HHD	15	91.25	12.41	49.53	110.27	1.85	1.85	0.06	0.001	0.005	0.011	0.000	0.000	0.000
Total													0.007	0.030	0.066	0.002	0.002	0.000	

Notes:

1. Assumed no change in annual VMT from 2007.
2. Running exhaust emissions calculated using the EMFAC2007 model with the BURDEN output option.
3. Running exhaust emission factor calculations assumed an average speed of 15 mph.
4. Idling time (hr/yr) is an engineering estimate based on discussions with UPRR staff.
5. Idling exhaust emissions factors calculated using the EMFAC2007 model with the EMFAC output option.

Summary of Emissions from Diesel-Fueled Yard Trucks
Colton Rail Yard

Running Exhaust Emissions

Equipment Type	Equipment ID/Owner	Vehicle ID	Vehicle Make/Model	Year	Vehicle Class	Annual VMT (miles/yr) ¹	2015 Emission Factors (g/mi) ^{2,3}						2015 Emissions (tpy)					
							ROG	CO	NOx	PM10	DPM	SOx	ROG	CO	NOx	PM10	DPM	SOx
Truck	Engineering	69496	Chevy CK 3500	1998	LDT	17,060	0.12	0.84	1.43	0.12	0.12	0.00	0.002	0.016	0.027	0.002	0.002	0.000
Truck	Engineering	69499	Chevy CK 3500	1998	LDT	20,042	0.12	0.84	1.43	0.12	0.12	0.00	0.003	0.018	0.032	0.003	0.003	0.000
Truck	Car Dept	1915-73119	Ford F-450	2003	LHDT1	5,250	0.43	1.96	6.04	0.11	0.07	0.00	0.002	0.011	0.035	0.001	0.000	0.000
Truck	Engineering	9007E	Ford F-800	1992	MHD	3,353	0.82	9.07	16.49	0.82	0.82	0.00	0.003	0.034	0.061	0.003	0.003	0.000
Truck	Engineering	9009E	Ford F-800	1992	MHD	3,053	0.82	9.07	16.49	0.82	0.82	0.00	0.003	0.031	0.056	0.003	0.003	0.000
Truck	Engineering	9031E	Ford F-800	1992	MHD	9,929	0.82	9.07	16.49	0.82	0.82	0.00	0.009	0.099	0.181	0.009	0.009	0.000
Truck	Engineering	9018E	Ford F-800	1992	MHD	10,114	0.82	9.07	16.49	0.82	0.82	0.00	0.009	0.101	0.184	0.009	0.009	0.000
Truck	Car Dept	NA	International	1987	HHD	156	6.48	40.18	27.22	5.18	5.18	0.00	0.001	0.007	0.005	0.001	0.001	0.000
Truck	Engineering	64274	Ford LT8000	1989	HHD	18,197	7.26	40.52	26.61	4.84	4.84	0.00	0.146	0.813	0.534	0.097	0.097	0.000
Truck	Car Dept	1915-9038E	Ford LT9000	1997	HHD	16,001	4.48	18.03	25.98	1.79	1.68	0.00	0.079	0.318	0.458	0.032	0.030	0.000
Total													0.26	1.45	1.57	0.16	0.16	0.00

Idling Exhaust Emissions

Equipment Type	Equipment ID/Owner	Vehicle ID	Vehicle Make/Model	Year	Vehicle Class	Idling ⁴		2015 Emission Factors (g/hr) ⁵						2015 Emissions (tpy)					
						(min/day)	(hr/yr)	ROG	CO	NOx	PM10	DPM	SOx	ROG	CO	NOx	PM10	DPM	SOx
Truck	Engineering	69496	Chevy CK 3500	1998	LDT	15	91.25	0.00	0.00	0.00	0.00	0.00	0.00	0.000	0.000	0.000	0.000	0.000	0.000
Truck	Engineering	69499	Chevy CK 3500	1998	LDT	15	91.25	0.00	0.00	0.00	0.00	0.00	0.00	0.000	0.000	0.000	0.000	0.000	0.000
Truck	Car Dept	1915-73119	Ford F-450	2003	LHDT2	15	91.25	3.17	26.30	75.05	0.72	0.72	0.04	0.000	0.003	0.008	0.000	0.000	0.000
Truck	Engineering	9007E	Ford F-800	1992	MHD	15	91.25	3.17	26.30	75.05	1.34	1.34	0.04	0.000	0.003	0.008	0.000	0.000	0.000
Truck	Engineering	9009E	Ford F-800	1992	MHD	15	91.25	3.17	26.30	75.05	1.34	1.34	0.04	0.000	0.003	0.008	0.000	0.000	0.000
Truck	Engineering	9031E	Ford F-800	1992	MHD	15	91.25	3.17	26.30	75.05	1.34	1.34	0.04	0.000	0.003	0.008	0.000	0.000	0.000
Truck	Engineering	9018E	Ford F-800	1992	MHD	15	91.25	3.17	26.30	75.05	1.34	1.34	0.04	0.000	0.003	0.008	0.000	0.000	0.000
Truck	Car Dept	NA	International	1987	HHD	15	91.25	22.84	61.55	82.94	4.12	4.12	0.06	0.002	0.006	0.008	0.000	0.000	0.000
Truck	Engineering	64274	Ford LT8000	1989	HHD	15	91.25	19.45	58.49	85.53	3.30	3.30	0.06	0.002	0.006	0.009	0.000	0.000	0.000
Truck	Car Dept	1915-9038E	Ford LT9000	1997	HHD	15	91.25	12.41	49.53	110.27	1.85	1.85	0.06	0.001	0.005	0.011	0.000	0.000	0.000
Total													0.007	0.030	0.066	0.002	0.002	0.000	

Notes:

1. Assumed no change in annual VMT from 2007.
2. Running exhaust emissions calculated using the EMFAC2007 model with the BURDEN output option.
3. Running exhaust emission factor calculations assumed an average speed of 15 mph.
4. Idling time (hr/yr) is an engineering estimate based on discussions with UPRR staff.
5. Idling exhaust emissions factors calculated using the EMFAC2007 model with the EMFAC output option.

Summary of Emissions from Diesel-Fueled Yard Trucks
Colton Rail Yard

Running Exhaust Emissions

Equipment Type	Equipment ID/Owner	Vehicle ID	Vehicle Make/Model	Year	Vehicle Class	Annual VMT (miles/yr) ¹	2020 Emission Factors (g/mi) ^{2,3}					2020 Emissions (tpy)						
							ROG	CO	NOx	PM10	DPM	SOx	ROG	CO	NOx	PM10	DPM	SOx
Truck	Engineering	69496	Chevy CK 3500	1998	LDT	17,060	0.00	0.76	1.51	0.00	0.00	0.000	0.014	0.028	0.000	0.000	0.000	
Truck	Engineering	69499	Chevy CK 3500	1998	LDT	20,042	0.00	0.76	1.51	0.00	0.00	0.000	0.017	0.033	0.000	0.000	0.000	
Truck	Car Dept	1915-73119	Ford F-450	2003	LHDT1	5,250	0.48	2.28	6.15	0.11	0.11	0.00	0.003	0.013	0.036	0.001	0.001	0.000
Truck	Engineering	9007E	Ford F-800	1992	MHD	3,353	1.81	9.07	16.33	1.81	1.81	0.00	0.007	0.034	0.060	0.007	0.007	0.000
Truck	Engineering	9009E	Ford F-800	1992	MHD	3,053	1.81	9.07	16.33	1.81	1.81	0.00	0.006	0.031	0.055	0.006	0.006	0.000
Truck	Engineering	9031E	Ford F-800	1992	MHD	9,929	1.81	9.07	16.33	1.81	1.81	0.00	0.020	0.099	0.179	0.020	0.020	0.000
Truck	Engineering	9018E	Ford F-800	1992	MHD	10,114	1.81	9.07	16.33	1.81	1.81	0.00	0.020	0.101	0.182	0.020	0.020	0.000
Truck	Car Dept	NA	International	1987	HHD	156	9.07	45.36	27.22	9.07	9.07	0.00	0.002	0.008	0.005	0.002	0.002	0.000
Truck	Engineering	64274	Ford LT8000	1989	HHD	18,197	9.07	45.36	30.24	6.05	6.05	0.00	0.182	0.910	0.607	0.121	0.121	0.000
Truck	Car Dept	1915-9038E	Ford LT9000	1997	HHD	16,001	4.70	19.49	26.21	2.02	1.68	0.00	0.083	0.344	0.462	0.036	0.030	0.000
Total													0.32	1.57	1.65	0.21	0.21	0.00

Idling Exhaust Emissions

Equipment Type	Equipment ID/Owner	Vehicle ID	Vehicle Make/Model	Year	Vehicle Class	Idling ⁴		2020 Emission Factors (g/hr) ⁵					2020 Emissions (tpy)						
						(min/day)	(hr/yr)	ROG	CO	NOx	PM10	DPM	SOx	ROG	CO	NOx	PM10	DPM	SOx
Truck	Engineering	69496	Chevy CK 3500	1998	LDT	15	91.25	0.00	0.00	0.00	0.00	0.00	0.000	0.000	0.000	0.000	0.000	0.000	
Truck	Engineering	69499	Chevy CK 3500	1998	LDT	15	91.25	0.00	0.00	0.00	0.00	0.00	0.000	0.000	0.000	0.000	0.000	0.000	
Truck	Car Dept	1915-73119	Ford F-450	2003	LHDT2	15	91.25	3.17	26.30	75.05	0.72	0.72	0.04	0.000	0.003	0.008	0.000	0.000	0.000
Truck	Engineering	9007E	Ford F-800	1992	MHD	15	91.25	3.17	26.30	75.05	1.34	1.34	0.04	0.000	0.003	0.008	0.000	0.000	0.000
Truck	Engineering	9009E	Ford F-800	1992	MHD	15	91.25	3.17	26.30	75.05	1.34	1.34	0.04	0.000	0.003	0.008	0.000	0.000	0.000
Truck	Engineering	9031E	Ford F-800	1992	MHD	15	91.25	3.17	26.30	75.05	1.34	1.34	0.04	0.000	0.003	0.008	0.000	0.000	0.000
Truck	Engineering	9018E	Ford F-800	1992	MHD	15	91.25	3.17	26.30	75.05	1.34	1.34	0.04	0.000	0.003	0.008	0.000	0.000	0.000
Truck	Car Dept	NA	International	1987	HHD	15	91.25	22.84	61.55	82.94	4.12	4.12	0.06	0.002	0.006	0.008	0.000	0.000	0.000
Truck	Engineering	64274	Ford LT8000	1989	HHD	15	91.25	19.45	58.49	85.53	3.30	3.30	0.06	0.002	0.006	0.009	0.000	0.000	0.000
Truck	Car Dept	1915-9038E	Ford LT9000	1997	HHD	15	91.25	12.41	49.53	110.27	1.85	1.85	0.06	0.001	0.005	0.011	0.000	0.000	0.000
Total													0.007	0.030	0.066	0.002	0.002	0.000	

Notes:

1. Assumed no change in annual VMT from 2007.
2. Running exhaust emissions calculated using the EMFAC2007 model with the BURDEN output option.
3. Running exhaust emission factor calculations assumed an average speed of 15 mph.
4. Idling time (hr/yr) is an engineering estimate based on discussions with UPRR staff.
5. Idling exhaust emissions factors calculated using the EMFAC2007 model with the EMFAC output option.

Title : Statewide totals Avg Annual CYr 2005 Default Title

Version : Emfac2007 V2.3 Nov 1 2006 ** WIS Enabled **

Run Date : 2007/08/29 12:52:46

Scen Year: 2005 -- Model year 1998 selected

Season : Annual

Area : Statewide totals Average

I/M Stat : Enhanced Interim (2005) -- Using I/M schedule for area 59 Los Angeles (SC)

Emissions: Tons Per Day

Model Year	1998	2003	1992	1987	1989	1997
	LDT1-DSL	LHDT1-DSL	MHDT-DSL	HHDT-DSL	HHDT-DSL	HHDT-DSL
Vehicles	4219	15619	1059	816	1237	1395
VMT/1000	153	822	58	84	149	345
Trips	27083	196467	29682	4129	6260	7058
Reactive Organic Gas Emissions						
Run Exh	0.02	0.3	0.06	1.14	1.98	2.63
Idle Exh	0	0	0	0.03	0.04	0.03
Start Ex	0	0	0	0	0	0
	-----	-----	-----	-----	-----	-----
Total Ex	0.02	0.3	0.06	1.18	2.03	2.66
Diurnal	0	0	0	0	0	0
Hot Soak	0	0	0	0	0	0
Running	0	0	0	0	0	0
Resting	0	0	0	0	0	0
	-----	-----	-----	-----	-----	-----
Total	0.02	0.3	0.06	1.18	2.03	2.66
Carbon Monoxide Emissions						
Run Exh	0.19	1.54	0.62	3.82	6.62	6.46
Idle Exh	0	0.02	0	0.09	0.13	0.13
Start Ex	0	0	0	0	0	0
	-----	-----	-----	-----	-----	-----
Total Ex	0.19	1.55	0.62	3.91	6.76	6.59
Oxides of Nitrogen Emissions						
Run Exh	0.27	6.07	1.18	2.95	5.19	11.81
Idle Exh	0	0.04	0.01	0.13	0.2	0.29
Start Ex	0	0	0	0	0	0
	-----	-----	-----	-----	-----	-----
Total Ex	0.27	6.12	1.19	3.07	5.39	12.1
Carbon Dioxide Emissions (000)						
Run Exh	0.06	0.47	0.1	0.27	0.47	1.09
Idle Exh	0	0	0	0.01	0.02	0.02
Start Ex	0	0	0	0	0	0
	-----	-----	-----	-----	-----	-----
Total Ex	0.06	0.47	0.1	0.28	0.49	1.11
PM10 Emissions						
Run Exh	0.01	0.07	0.08	0.53	0.89	0.86
Idle Exh	0	0	0	0.01	0.01	0
Start Ex	0	0	0	0	0	0
	-----	-----	-----	-----	-----	-----
Total Ex	0.01	0.08	0.08	0.53	0.9	0.86
TireWear	0	0.01	0	0	0.01	0.01
BrakeWr	0	0.01	0	0	0	0.01
	-----	-----	-----	-----	-----	-----
Total	0.01	0.1	0.08	0.54	0.91	0.89
Lead	0	0	0	0	0	0
SOx	0.01	0.04	0.01	0.02	0.04	0.09
Fuel Consumption (000 gallons)						
Gasoline	0	0	0	0	0	0
Diesel	5.24	42.56	8.66	24.86	43.8	99.81

Title : 1998 LDT1_Statewide Avg_CY 2007
 Version : Emfac2007 V2.3 Nov 1 2006 ** WIS Enabled **
 Run Date : 2008/11/24 13:35:09
 Scen Year: 2007 -- Model year 1998 selected
 Season : Annual
 Area : Statewide totals Average
 I/M Stat : Enhanced Interim (2005) -- Using I/M schedule for area 59 Los Angeles (SC)
 Emissions: Tons Per Day

Model Year	1998	2003	1992	1987	1989	1997
	LDT1-DSL	LHDT1-DSL	MHDT-DSL	HHDT-DSL	HHDT-DSL	HHDT-DSL
Vehicles	3943	11219	723	532	867	1166
VMT/1000	133	523	34	48	90	242
Trips	25036	141124	20275	2690	4387	5901
Reactive Organic Gas Emissions						
Run Exh	0.01	0.17	0.02	0.34	0.64	0.92
Idle Exh	0	0	0	0.02	0.03	0.03
Start Ex	0	0	0	0	0	0
	-----	-----	-----	-----	-----	-----
Total Ex	0.01	0.18	0.02	0.37	0.67	0.95
Diurnal	0	0	0	0	0	0
Hot Soak	0	0	0	0	0	0
Running	0	0	0	0	0	0
Resting	0	0	0	0	0	0
	-----	-----	-----	-----	-----	-----
Total	0.01	0.18	0.02	0.37	0.67	0.95
Carbon Monoxide Emissions						
Run Exh	0.12	0.82	0.18	1.93	3.59	3.71
Idle Exh	0	0.01	0	0.06	0.09	0.11
Start Ex	0	0	0	0	0	0
	-----	-----	-----	-----	-----	-----
Total Ex	0.12	0.83	0.18	1.99	3.69	3.82
Oxides of Nitrogen Emissions						
Run Exh	0.21	3.4	0.72	1.4	2.63	6.48
Idle Exh	0	0.03	0.01	0.08	0.14	0.24
Start Ex	0	0	0	0	0	0
	-----	-----	-----	-----	-----	-----
Total Ex	0.21	3.44	0.72	1.48	2.77	6.72
Carbon Dioxide Emissions (000)						
Run Exh	0.05	0.3	0.06	0.12	0.23	0.63
Idle Exh	0	0	0	0.01	0.01	0.01
Start Ex	0	0	0	0	0	0
	-----	-----	-----	-----	-----	-----
Total Ex	0.05	0.3	0.06	0.13	0.24	0.64
PM10 Emissions						
Run Exh	0.01	0.04	0.02	0.23	0.41	0.37
Idle Exh	0	0	0	0	0.01	0
Start Ex	0	0	0	0	0	0
	-----	-----	-----	-----	-----	-----
Total Ex	0.01	0.04	0.02	0.23	0.42	0.38
TireWear	0	0.01	0	0	0	0.01
BrakeWr	0	0.01	0	0	0	0.01
	-----	-----	-----	-----	-----	-----
Total	0.01	0.05	0.02	0.24	0.43	0.39
Lead	0	0	0	0	0	0
SOx	0	0	0	0	0	0.01
Fuel Consumption (000 gallons)						
Gasoline	0	0	0	0	0	0
Diesel	4.56	27.07	5.17	11.68	21.88	57.8

Title : 1998 LDT1_Statewide Avg_CY 2010
 Version : Emfac2007 V2.3 Nov 1 2006 ** WIS Enabled **
 Run Date : 2008/11/24 13:35:09
 Scen Year: 2010 -- Model year 1998 selected
 Season : Annual
 Area : Statewide totals Average
 I/M Stat : Enhanced Interim (2005) -- Using I/M schedule for area 59 Los Angeles (SC)
 Emissions: Tons Per Day

Model Year	1998	2003	1992	1987	1989	1997
	LDT1-DSL	LHDT1-DSL	MHDT-DSL	HHDT-DSL	HHDT-DSL	HHDT-DSL
Vehicles	3697	8986	584	373	630	1128
VMT/1000	114	370	23	27	52	177
Trips	22993	113028	16374	1887	3188	5708
Reactive Organic Gas Emissions						
Run Exh	0.01	0.14	0.02	0.2	0.39	0.76
Idle Exh	0	0	0	0.02	0.02	0.03
Start Ex	0	0	0	0	0	0
	-----	-----	-----	-----	-----	-----
Total Ex	0.01	0.14	0.02	0.22	0.42	0.79
Diurnal	0	0	0	0	0	0
Hot Soak	0	0	0	0	0	0
Running	0	0	0	0	0	0
Resting	0	0	0	0	0	0
	-----	-----	-----	-----	-----	-----
Total	0.01	0.14	0.02	0.22	0.42	0.79
Carbon Monoxide Emissions						
Run Exh	0.1	0.67	0.21	1.13	2.21	3.09
Idle Exh	0	0.01	0	0.04	0.07	0.1
Start Ex	0	0	0	0	0	0
	-----	-----	-----	-----	-----	-----
Total Ex	0.1	0.68	0.21	1.17	2.28	3.19
Oxides of Nitrogen Emissions						
Run Exh	0.18	2.44	0.42	0.79	1.55	4.89
Idle Exh	0	0.03	0	0.06	0.1	0.23
Start Ex	0	0	0	0	0	0
	-----	-----	-----	-----	-----	-----
Total Ex	0.18	2.46	0.42	0.85	1.65	5.12
Carbon Dioxide Emissions (000)						
Run Exh	0.04	0.21	0.04	0.07	0.14	0.46
Idle Exh	0	0	0	0	0.01	0.01
Start Ex	0	0	0	0	0	0
	-----	-----	-----	-----	-----	-----
Total Ex	0.04	0.21	0.04	0.07	0.14	0.47
PM10 Emissions						
Run Exh	0.01	0.03	0.03	0.13	0.25	0.3
Idle Exh	0	0	0	0	0	0
Start Ex	0	0	0	0	0	0
	-----	-----	-----	-----	-----	-----
Total Ex	0.01	0.03	0.03	0.14	0.26	0.31
TireWear	0	0	0	0	0	0.01
BrakeWr	0	0.01	0	0	0	0.01
	-----	-----	-----	-----	-----	-----
Total	0.01	0.04	0.03	0.14	0.26	0.32
Lead	0	0	0	0	0	0
SOx	0	0	0	0	0	0
Fuel Consumption (000 gallons)						
Gasoline	0	0	0	0	0	0
Diesel	3.91	19.2	3.4	6.62	12.93	42.58

Title : 1998 LDT1_Statewide Avg_CY 2015
 Version : Emfac2007 V2.3 Nov 1 2006 ** WIS Enabled **
 Run Date : 2008/11/24 13:35:09
 Scen Year: 2015 -- Model year 1998 selected
 Season : Annual
 Area : Statewide totals Average
 I/M Stat : Enhanced Interim (2005) -- Using I/M schedule for area 59 Los Angeles (SC)
 Emissions: Tons Per Day

Model Year	1998	2003	1992	1987	1989	1997
	LDT1-DSL	LHDT1-DSL	MHDT-DSL	HHDT-DSL	HHDT-DSL	HHDT-DSL
Vehicles	2784	7116	390	165	278	781
VMT/1000	76	254	11	7	15	81
Trips	16704	89508	10925	835	1404	3952
Reactive Organic Gas Emissions						
Run Exh	0.01	0.12	0.01	0.05	0.12	0.4
Idle Exh	0	0	0	0.01	0.01	0.02
Start Ex	0	0	0	0	0	0
	-----	-----	-----	-----	-----	-----
Total Ex	0.01	0.12	0.01	0.06	0.13	0.42
Diurnal	0	0	0	0	0	0
Hot Soak	0	0	0	0	0	0
Running	0	0	0	0	0	0
Resting	0	0	0	0	0	0
	-----	-----	-----	-----	-----	-----
Total	0.01	0.12	0.01	0.06	0.13	0.42
Carbon Monoxide Emissions						
Run Exh	0.07	0.55	0.11	0.31	0.67	1.61
Idle Exh	0	0.01	0	0.02	0.03	0.07
Start Ex	0	0	0	0	0	0
	-----	-----	-----	-----	-----	-----
Total Ex	0.07	0.56	0.11	0.32	0.7	1.68
Oxides of Nitrogen Emissions						
Run Exh	0.12	1.69	0.2	0.21	0.44	2.32
Idle Exh	0	0.02	0	0.03	0.04	0.16
Start Ex	0	0	0	0	0	0
	-----	-----	-----	-----	-----	-----
Total Ex	0.12	1.71	0.21	0.23	0.49	2.48
Carbon Dioxide Emissions (000)						
Run Exh	0.03	0.15	0.02	0.02	0.04	0.21
Idle Exh	0	0	0	0	0	0.01
Start Ex	0	0	0	0	0	0
	-----	-----	-----	-----	-----	-----
Total Ex	0.03	0.15	0.02	0.02	0.04	0.22
PM10 Emissions						
Run Exh	0	0.02	0.01	0.04	0.08	0.15
Idle Exh	0	0	0	0	0	0
Start Ex	0	0	0	0	0	0
	-----	-----	-----	-----	-----	-----
Total Ex	0	0.02	0.01	0.04	0.08	0.16
TireWear	0	0	0	0	0	0
BrakeWr	0	0	0	0	0	0
	-----	-----	-----	-----	-----	-----
Total	0.01	0.03	0.01	0.04	0.08	0.16
Lead	0	0	0	0	0	0
SOx	0	0	0	0	0	0
Fuel Consumption (000 gallons)						
Gasoline	0	0	0	0	0	0
Diesel	2.6	13.16	1.62	1.79	3.78	19.72

Title : 1998 LDT1_Statewide Avg_CY 2020
 Version : Emfac2007 V2.3 Nov 1 2006 ** WIS Enabled **
 Run Date : 2008/11/24 13:35:09
 Scen Year: 2020 -- Model year 1998 selected
 Season : Annual
 Area : Statewide totals Average
 I/M Stat : Enhanced Interim (2005) -- Using I/M schedule for area 59 Los Angeles (SC)
 Emissions: Tons Per Day

Model Year	1998	2003	1992	1987	1989	1997
	LDT1-DSL	LHDT1-DSL	MHDT-DSL	HHDT-DSL	HHDT-DSL	HHDT-DSL
Vehicles	1980	5395	249	67	126	374
VMT/1000	48	171	5	1	3	27
Trips	11363	67862	6994	341	639	1895
Reactive Organic Gas Emissions						
Run Exh	0	0.09	0.01	0.01	0.03	0.14
Idle Exh	0	0	0	0	0	0.01
Start Ex	0	0	0	0	0	0
	-----	-----	-----	-----	-----	-----
Total Ex	0	0.09	0.01	0.01	0.03	0.15
Diurnal	0	0	0	0	0	0
Hot Soak	0	0	0	0	0	0
Running	0	0	0	0	0	0
Resting	0	0	0	0	0	0
	-----	-----	-----	-----	-----	-----
Total	0	0.09	0.01	0.01	0.03	0.15
Carbon Monoxide Emissions						
Run Exh	0.04	0.43	0.05	0.05	0.15	0.58
Idle Exh	0	0.01	0	0.01	0.01	0.03
Start Ex	0	0	0	0	0	0
	-----	-----	-----	-----	-----	-----
Total Ex	0.04	0.43	0.05	0.06	0.16	0.61
Oxides of Nitrogen Emissions						
Run Exh	0.08	1.16	0.09	0.03	0.1	0.78
Idle Exh	0	0.02	0	0.01	0.02	0.08
Start Ex	0	0	0	0	0	0
	-----	-----	-----	-----	-----	-----
Total Ex	0.08	1.18	0.09	0.05	0.12	0.86
Carbon Dioxide Emissions (000)						
Run Exh	0.02	0.1	0.01	0	0.01	0.07
Idle Exh	0	0	0	0	0	0
Start Ex	0	0	0	0	0	0
	-----	-----	-----	-----	-----	-----
Total Ex	0.02	0.1	0.01	0	0.01	0.07
PM10 Emissions						
Run Exh	0	0.02	0.01	0.01	0.02	0.05
Idle Exh	0	0	0	0	0	0
Start Ex	0	0	0	0	0	0
	-----	-----	-----	-----	-----	-----
Total Ex	0	0.02	0.01	0.01	0.02	0.06
TireWear	0	0	0	0	0	0
BrakeWr	0	0	0	0	0	0
	-----	-----	-----	-----	-----	-----
Total	0	0.02	0.01	0.01	0.02	0.06
Lead	0	0	0	0	0	0
SOx	0	0	0	0	0	0
Fuel Consumption (000 gallons)						
Gasoline	0	0	0	0	0	0
Diesel	1.65	8.9	0.7	0.34	0.89	6.65

Title : Statewide totals Avg Annual CYr 2005 Default Title

Version : Emfac2007 V2.3 Nov 1 2006 ** WIS Enabled **

Run Date : 2007/08/29 12:53:28

Scen Year: 2005 -- Model year 1998 selected

Season : Annual

Area : Statewide totals

Emfac2007 Emission Factors: V2.3 Nov 1 2006 ** WIS Enabled **

State Average

Table 1: Running Exhaust Emissions (grams/mile; grams/idle-hour)

Temperature: 65F

Relative Humidity: 60%

Calendar Year		2005					
Model Year		1998	2003	1992	1987	1989	1997
Pollutant	Speed	LDT1	LHD1	MHD	HHD	HHD	HHD
	MPH	DSL	DSL	DSL	DSL	DSL	DSL
ROG	0	0	3.173	3.173	22.835	19.449	12.413
CO	0	0	26.3	26.3	61.549	58.485	49.525
Nox	0	0	75.051	75.051	82.939	85.533	110.267
CO2	0	0	4098	4098	6617.134	6617.134	6617.135
SOx	0	0	0.341	0.341	0.55	0.55	0.55
PM10	0	0	0.753	1.395	4.282	3.433	1.928
PM10-Tire	0	0	0	0	0	0	0
PM10-Brake	0	0	0	0	0	0	0
Gasoline (mi/gal)	0	0	0	0	0	0	0
Diesel (mi/gal)	0	0	0	0	0	0	0

Title : 1998_LDT_Statewide Avg_CY 2007

Version : Emfac2007 V2.3 Nov 1 2006

Run Date : 2008/11/24 14:04:11

Scen Year: 2007 -- Model year 1998 selected

Season : Annual

Area : Statewide totals

Emfac2007 Emission Factors: V2.3 Nov 1 2006

State Average

Table 1: Running Exhaust Emissions (grams/mile; grams/idle-hour)

Temperature: 65F

Relative Humidity: 60%

Calendar Year		2007					
Model Year	Speed	1998	2003	1992	1987	1989	1997
Pollutant	MPH	LDT1	LHD1	MHD	HHD	HHD	HHD
ROG	0	0	3.173	3.173	22.835	19.449	12.413
CO	0	0	26.3	26.3	61.549	58.485	49.525
Nox	0	0	75.051	75.051	82.939	85.533	110.267
CO2	0	0	4098	4098	6617.134	6617.134	6617.134
SOx	0	0	0.039	0.039	0.063	0.063	0.063
PM10	0	0	0.723	1.339	4.116	3.3	1.853
PM10-Tire	0	0	0	0	0	0	0
PM10-Brake	0	0	0	0	0	0	0
Gasoline (mi/gal)	0	0	0	0	0	0	0
Diesel (mi/gal)	0	0	0	0	0	0	0

Title : 1998_LDT_Statewide Avg_CY 2010

Version : Emfac2007 V2.3 Nov 1 2006

Run Date : 2008/11/24 14:04:11

Scen Year: 2010 -- Model year 1998 selected

Season : Annual

Area : Statewide totals

Emfac2007 Emission Factors: V2.3 Nov 1 2006

State Average

Table 1: Running Exhaust Emissions (grams/mile; grams/idle-hour)

Temperature: 65F

Relative Humidity: 60%

Calendar Year		2010					
Model Year	Speed	1998	2003	1992	1987	1989	1997
Pollutant	MPH	LDT1	LHD1	MHD	HHD	HHD	HHD
ROG	0	0	3.173	3.173	22.835	19.449	12.413
CO	0	0	26.3	26.3	61.549	58.485	49.525
Nox	0	0	75.051	75.051	82.939	85.533	110.267
CO2	0	0	4098	4098	6617.134	6617.134	6617.134
SOx	0	0	0.039	0.039	0.063	0.063	0.063
PM10	0	0	0.723	1.339	4.116	3.3	1.853
PM10-Tire	0	0	0	0	0	0	0
PM10-Brake	0	0	0	0	0	0	0
Gasoline (mi/gal)	0	0	0	0	0	0	0
Diesel (mi/gal)	0	0	0	0	0	0	0

Title : 1998_LDT_Statewide Avg_CY 2015

Version : Emfac2007 V2.3 Nov 1 2006

Run Date : 2008/11/24 14:04:11

Scen Year: 2015 -- Model year 1998 selected

Season : Annual

Area : Statewide totals

Emfac2007 Emission Factors: V2.3 Nov 1 2006

State Average

Table 1: Running Exhaust Emissions (grams/mile; grams/idle-hour)

Temperature: 65F

Relative Humidity: 60%

Calendar Year		2015					
Model Year	Speed	1998	2003	1992	1987	1989	1997
Pollutant	MPH	LDT1	LHD1	MHD	HHD	HHD	HHD
ROG	0	0	3.173	3.173	22.835	19.449	12.413
CO	0	0	26.3	26.3	61.549	58.485	49.525
Nox	0	0	75.051	75.051	82.939	85.533	110.267
CO2	0	0	4098	4098	6617.135	6617.134	6617.134
SOx	0	0	0.039	0.039	0.063	0.063	0.063
PM10	0	0	0.723	1.339	4.116	3.3	1.853
PM10-Tire	0	0	0	0	0	0	0
PM10-Brake	0	0	0	0	0	0	0
Gasoline (mi/gal)	0	0	0	0	0	0	0
Diesel (mi/gal)	0	0	0	0	0	0	0

Title : 1998_LDT_Statewide Avg_CY 2020

Version : Emfac2007 V2.3 Nov 1 2006

Run Date : 2008/11/24 14:04:11

Scen Year: 2020 -- Model year 1998 selected

Season : Annual

Area : Statewide totals

Emfac2007 Emission Factors: V2.3 Nov 1 2006

State Average

Table 1: Running Exhaust Emissions (grams/mile; grams/idle-hour)

Temperature: 65F

Relative Humidity: 60%

Calendar Year		2020					
Model Year	Speed	1998	2003	1992	1987	1989	1997
Pollutant	MPH	LDT1	LHD1	MHD	HHD	HHD	HHD
ROG	0	0	3.173	3.173	22.835	19.449	12.413
CO	0	0	26.3	26.3	61.549	58.485	49.525
Nox	0	0	75.051	75.051	82.939	85.533	110.267
CO2	0	0	4098	4098	6617.134	6617.135	6617.134
SOx	0	0	0.039	0.039	0.063	0.063	0.063
PM10	0	0	0.723	1.339	4.116	3.3	1.853
PM10-Tire	0	0	0	0	0	0	0
PM10-Brake	0	0	0	0	0	0	0
Gasoline (mi/gal)	0	0	0	0	0	0	0
Diesel (mi/gal)	0	0	0	0	0	0	0

Delivery Trucks

Summary of Emissions from HHD Diesel-Fueled Delivery Trucks
Colton Rail Yard

Running Exhaust Emissions

Delivery Type	Truck Trips (trips/yr) ^{1,2}	VMT per Trip (mi/trip) ³	VMT per Year	2005 Emission Factors (g/mi) ^{4,5}						2005 Emission Estimates (tons/yr)					
				ROG	CO	NOx	PM10 ⁶	DPM ⁶	SOx	ROG	CO	NOx	PM10	DPM	SOx
Gasoline	2	0.33	0.66	6.40	17.23	28.68	2.53	2.47	0.24	0.00	0.00	0.00	0.00	0.00	0.00
Lube Oil	57	0.58	33.06	6.40	17.23	28.68	2.53	2.47	0.24	0.00	0.00	0.00	0.00	0.00	0.00
Used Oil	24	0.58	13.92	6.40	17.23	28.68	2.53	2.47	0.24	0.00	0.00	0.00	0.00	0.00	0.00
Soap	18	0.71	12.78	6.40	17.23	28.68	2.53	2.47	0.24	0.00	0.00	0.00	0.00	0.00	0.00
Sand	195	0.58	113.10	6.40	17.23	28.68	2.53	2.47	0.24	0.00	0.00	0.00	0.00	0.00	0.00
Total	296		173.52							1.22E-03	3.30E-03	5.49E-03	4.84E-04	4.72E-04	4.64E-05

Idling Exhaust Emissions

Delivery Type	Number of Truck Trips	Idling		2005 Emission Factors (g/hr) ⁸						2005 Emission Estimates (tons/yr)					
		(mins/trip) ⁷	(hr/yr)	ROG	CO	NOx	PM10	DPM	SOx	ROG	CO	NOx	PM10	DPM	SOx
Gasoline	2	10	0.33	16.16	52.99	100.38	2.85	2.85	0.55	0.00	0.00	0.00	0.00	0.00	0.00
Lube Oil	57	10	9.50	16.16	52.99	100.38	2.85	2.85	0.55	0.00	0.00	0.00	0.00	0.00	0.00
Used Oil	24	10	4.00	16.16	52.99	100.38	2.85	2.85	0.55	0.00	0.00	0.00	0.00	0.00	0.00
Soap	18	10	3.00	16.16	52.99	100.38	2.85	2.85	0.55	0.00	0.00	0.00	0.00	0.00	0.00
Sand	195	30	97.50	16.16	52.99	100.38	2.85	2.85	0.55	0.00	0.01	0.01	0.00	0.00	0.00
Total	296		114.33							2.04E-03	6.68E-03	1.27E-02	3.59E-04	3.59E-04	6.93E-05

Notes:

1. Annual truck trips based on annual product deliveries and a tanker truck volume of 8,000 gallons.
2. Annual sand delivery truck trips based on tons of sand used and a truck capacity of 20 tons.
3. VMT per truck trip estimated from Google Earth, for onsite travel only.
4. Running exhaust emission factors (g/mi) from EMFAC 2007 using the BURDEN output option. The EMFAC default model year distribution for L.A. County was used.
5. Emission factor calculations assumed an average speed of 15 mph.
6. The PM10 emission factor includes engine exhaust emissions along with brake and tire wear. The DPM emission factor includes engine exhaust emissions only.
7. Engineering estimate based on personal observation.
8. Idling exhaust emission factors from EMFAC 2007 using the EMFAC output option. The EMFAC default model year distribution for L.A. County was used.

Summary of Emissions from HHD Diesel-Fueled Delivery Trucks
Colton Rail Yard

Running Exhaust Emissions

Delivery Type	Truck Trips (trips/yr) ^{1,2}	VMT per Trip (mi/trip) ³	VMT per Year	2007 Emission Factors (g/mi) ^{4,5}						2007 Emission Estimates (tons/yr)					
				ROG	CO	NOx	PM10 ⁶	DPM ⁶	SOx	ROG	CO	NOx	PM10	DPM	SOx
Gasoline	2	0.33	0.66	2.74	11.82	20.91	1.42	1.35	0.02	0.00	0.00	0.00	0.00	0.00	0.00
Lube Oil	58	0.58	33.64	2.74	11.82	20.91	1.42	1.35	0.02	0.00	0.00	0.00	0.00	0.00	0.00
Used Oil	25	0.58	14.50	2.74	11.82	20.91	1.42	1.35	0.02	0.00	0.00	0.00	0.00	0.00	0.00
Soap	18	0.71	12.78	2.74	11.82	20.91	1.42	1.35	0.02	0.00	0.00	0.00	0.00	0.00	0.00
Sand	199	0.58	115.42	2.74	11.82	20.91	1.42	1.35	0.02	0.00	0.00	0.00	0.00	0.00	0.00
Total	302		177.00							5.34E-04	2.31E-03	4.08E-03	2.76E-04	2.64E-04	4.67E-06

Idling Exhaust Emissions

Delivery Type	Number of Truck Trips	Idling		2007 Emission Factors (g/hr) ⁸						2007 Emission Estimates (tons/yr)					
		(mins/trip) ⁷	(hr/yr)	ROG	CO	NOx	PM10	DPM	SOx	ROG	CO	NOx	PM10	DPM	SOx
Gasoline	2	10	0.33	14.57	51.00	104.62	2.36	2.36	0.06	0.00	0.00	0.00	0.00	0.00	0.00
Lube Oil	58	10	9.67	14.57	51.00	104.62	2.36	2.36	0.06	0.00	0.00	0.00	0.00	0.00	0.00
Used Oil	25	10	4.17	14.57	51.00	104.62	2.36	2.36	0.06	0.00	0.00	0.00	0.00	0.00	0.00
Soap	18	10	3.00	14.57	51.00	104.62	2.36	2.36	0.06	0.00	0.00	0.00	0.00	0.00	0.00
Sand	199	30	99.50	14.57	51.00	104.62	2.36	2.36	0.06	0.00	0.01	0.01	0.00	0.00	0.00
Total	302		116.67							1.87E-03	6.56E-03	1.35E-02	3.03E-04	3.03E-04	8.10E-06

Notes:

1. Annual truck trips based on annual product deliveries and a tanker truck volume of 8,000 gallons.
2. Annual sand delivery truck trips based on tons of sand used and a truck capacity of 20 tons.
3. VMT per truck trip estimated from Google Earth, for onsite travel only.
4. Running exhaust emission factors (g/mi) from EMFAC 2007 using the BURDEN output option. The EMFAC default model year distribution for L.A. County was used.
5. Emission factor calculations assumed an average speed of 15 mph.
6. The PM10 emission factor includes engine exhaust emissions along with brake and tire wear. The DPM emission factor includes engine exhaust emissions only.
7. Engineering estimate based on personal observation.
8. Idling exhaust emission factors from EMFAC 2007 using the EMFAC output option. The EMFAC default model year distribution for L.A. County was used.

Summary of Emissions from HHD Diesel-Fueled Delivery Trucks
Colton Rail Yard

Running Exhaust Emissions

Delivery Type	Truck Trips (trips/yr) ^{1,2}	VMT per Trip (mi/trip) ³	VMT per Year	2010 Emission Factors (g/mi) ^{4,5}						2010 Emission Estimates (tons/yr)					
				ROG	CO	NOx	PM10 ⁶	DPM ⁶	SOx	ROG	CO	NOx	PM10	DPM	SOx
Gasoline	2	0.33	0.66	2.25	9.17	17.42	1.05	0.99	0.02	0.00	0.00	0.00	0.00	0.00	0.00
Lube Oil	60	0.58	34.80	2.25	9.17	17.42	1.05	0.99	0.02	0.00	0.00	0.00	0.00	0.00	0.00
Used Oil	26	0.58	15.08	2.25	9.17	17.42	1.05	0.99	0.02	0.00	0.00	0.00	0.00	0.00	0.00
Soap	19	0.71	13.49	2.25	9.17	17.42	1.05	0.99	0.02	0.00	0.00	0.00	0.00	0.00	0.00
Sand	205	0.58	118.90	2.25	9.17	17.42	1.05	0.99	0.02	0.00	0.00	0.00	0.00	0.00	0.00
Total	312		182.93							4.54E-04	1.85E-03	3.51E-03	2.12E-04	1.99E-04	4.76E-06

Idling Exhaust Emissions

Delivery Type	Number of Truck Trips	Idling		2010 Emission Factors (g/hr) ⁸						2010 Emission Estimates (tons/yr)					
		(mins/trip) ⁷	(hr/yr)	ROG	CO	NOx	PM10	DPM	SOx	ROG	CO	NOx	PM10	DPM	SOx
Gasoline	2	10	0.33	12.49	48.29	110.26	1.79	1.79	0.06	0.00	0.00	0.00	0.00	0.00	0.00
Lube Oil	60	10	10.00	12.49	48.29	110.26	1.79	1.79	0.06	0.00	0.00	0.00	0.00	0.00	0.00
Used Oil	26	10	4.33	12.49	48.29	110.26	1.79	1.79	0.06	0.00	0.00	0.00	0.00	0.00	0.00
Soap	19	10	3.17	12.49	48.29	110.26	1.79	1.79	0.06	0.00	0.00	0.00	0.00	0.00	0.00
Sand	205	30	102.50	12.49	48.29	110.26	1.79	1.79	0.06	0.00	0.01	0.01	0.00	0.00	0.00
Total	312		120.33							1.66E-03	6.41E-03	1.46E-02	2.38E-04	2.38E-04	8.36E-06

Notes:

1. Annual truck trips based on annual product deliveries and a tanker truck volume of 8,000 gallons.
2. Annual sand delivery truck trips based on tons of sand used and a truck capacity of 20 tons.
3. VMT per truck trip estimated from Google Earth, for onsite travel only.
4. Running exhaust emission factors (g/mi) from EMFAC 2007 using the BURDEN output option. The EMFAC default model year distribution for L.A. County was used.
5. Emission factor calculations assumed an average speed of 15 mph.
6. The PM10 emission factor includes engine exhaust emissions along with brake and tire wear. The DPM emission factor includes engine exhaust emissions only.
7. Engineering estimate based on personal observation.
8. Idling exhaust emission factors from EMFAC 2007 using the EMFAC output option. The EMFAC default model year distribution for L.A. County was used.

Summary of Emissions from HHD Diesel-Fueled Delivery Trucks
Colton Rail Yard

Running Exhaust Emissions

Delivery Type	Truck Trips (trips/yr) ^{1,2}	VMT per Trip (mi/trip) ³	VMT per Year	2015 Emission Factors (g/mi) ^{4,5}						2015 Emission Estimates (tons/yr)					
				ROG	CO	NOx	PM10 ⁶	DPM ⁶	SOx	ROG	CO	NOx	PM10	DPM	SOx
Gasoline	2	0.33	0.66	1.31	4.80	10.00	0.52	0.46	0.02	0.00	0.00	0.00	0.00	0.00	0.00
Lube Oil	63	0.58	36.54	1.31	4.80	10.00	0.52	0.46	0.02	0.00	0.00	0.00	0.00	0.00	0.00
Used Oil	27	0.58	15.66	1.31	4.80	10.00	0.52	0.46	0.02	0.00	0.00	0.00	0.00	0.00	0.00
Soap	20	0.71	14.20	1.31	4.80	10.00	0.52	0.46	0.02	0.00	0.00	0.00	0.00	0.00	0.00
Sand	215	0.58	124.70	1.31	4.80	10.00	0.52	0.46	0.02	0.00	0.00	0.00	0.00	0.00	0.00
Total	327		191.76							2.77E-04	1.02E-03	2.11E-03	1.10E-04	9.67E-05	4.72E-06

Idling Exhaust Emissions

Delivery Type	Number of Truck Trips	Idling		2015 Emission Factors (g/hr) ⁸						2015 Emission Estimates (tons/yr)					
		(mins/trip) ⁷	(hr/yr)	ROG	CO	NOx	PM10	DPM	SOx	ROG	CO	NOx	PM10	DPM	SOx
Gasoline	2	10	0.33	9.89	44.71	117.38	1.00	1.00	0.06	0.00	0.00	0.00	0.00	0.00	0.00
Lube Oil	63	10	10.50	9.89	44.71	117.38	1.00	1.00	0.06	0.00	0.00	0.00	0.00	0.00	0.00
Used Oil	27	10	4.50	9.89	44.71	117.38	1.00	1.00	0.06	0.00	0.00	0.00	0.00	0.00	0.00
Soap	20	10	3.33	9.89	44.71	117.38	1.00	1.00	0.06	0.00	0.00	0.00	0.00	0.00	0.00
Sand	215	30	107.50	9.89	44.71	117.38	1.00	1.00	0.06	0.00	0.01	0.01	0.00	0.00	0.00
Total	327		126.17							1.38E-03	6.22E-03	1.63E-02	1.39E-04	1.39E-04	8.76E-06

Notes:

1. Annual truck trips based on annual product deliveries and a tanker truck volume of 8,000 gallons.
2. Annual sand delivery truck trips based on tons of sand used and a truck capacity of 20 tons.
3. VMT per truck trip estimated from Google Earth, for onsite travel only.
4. Running exhaust emission factors (g/mi) from EMFAC 2007 using the BURDEN output option. The EMFAC default model year distribution for L.A. County was used.
5. Emission factor calculations assumed an average speed of 15 mph.
6. The PM10 emission factor includes engine exhaust emissions along with brake and tire wear. The DPM emission factor includes engine exhaust emissions only.
7. Engineering estimate based on personal observation.
8. Idling exhaust emission factors from EMFAC 2007 using the EMFAC output option. The EMFAC default model year distribution for L.A. County was used.

Summary of Emissions from HHD Diesel-Fueled Delivery Trucks
Colton Rail Yard

Running Exhaust Emissions

Delivery Type	Truck Trips (trips/yr) ^{1,2}	VMT per Trip (mi/trip) ³	VMT per Year	2020 Emission Factors (g/mi) ^{4,5}						2020 Emission Estimates (tons/yr)					
				ROG	CO	NOx	PM10 ⁶	DPM ⁶	SOx	ROG	CO	NOx	PM10	DPM	SOx
Gasoline	2	0.33	0.66	0.80	2.65	6.19	0.27	0.21	0.02	0.00	0.00	0.00	0.00	0.00	0.00
Lube Oil	66	0.58	38.28	0.80	2.65	6.19	0.27	0.21	0.02	0.00	0.00	0.00	0.00	0.00	0.00
Used Oil	28	0.58	16.24	0.80	2.65	6.19	0.27	0.21	0.02	0.00	0.00	0.00	0.00	0.00	0.00
Soap	21	0.71	14.91	0.80	2.65	6.19	0.27	0.21	0.02	0.00	0.00	0.00	0.00	0.00	0.00
Sand	226	0.58	131.08	0.80	2.65	6.19	0.27	0.21	0.02	0.00	0.00	0.00	0.00	0.00	0.00
Total	343		201.17							1.78E-04	5.88E-04	1.37E-03	6.10E-05	4.67E-05	5.05E-06

Idling Exhaust Emissions

Delivery Type	Number of Truck Trips	Idling		2020 Emission Factors (g/hr) ⁸						2020 Emission Estimates (tons/yr)					
		(mins/trip) ⁷	(hr/yr)	ROG	CO	NOx	PM10	DPM	SOx	ROG	CO	NOx	PM10	DPM	SOx
Gasoline	2	10	0.33	8.57	42.79	121.00	0.53	0.53	0.06	0.00	0.00	0.00	0.00	0.00	0.00
Lube Oil	66	10	11.00	8.57	42.79	121.00	0.53	0.53	0.06	0.00	0.00	0.00	0.00	0.00	0.00
Used Oil	28	10	4.67	8.57	42.79	121.00	0.53	0.53	0.06	0.00	0.00	0.00	0.00	0.00	0.00
Soap	21	10	3.50	8.57	42.79	121.00	0.53	0.53	0.06	0.00	0.00	0.00	0.00	0.00	0.00
Sand	226	30	113.00	8.57	42.79	121.00	0.53	0.53	0.06	0.00	0.01	0.02	0.00	0.00	0.00
Total	343		132.50							1.25E-03	6.25E-03	1.77E-02	7.67E-05	7.67E-05	9.20E-06

Notes:

1. Annual truck trips based on annual product deliveries and a tanker truck volume of 8,000 gallons.
2. Annual sand delivery truck trips based on tons of sand used and a truck capacity of 20 tons.
3. VMT per truck trip estimated from Google Earth, for onsite travel only.
4. Running exhaust emission factors (g/mi) from EMFAC 2007 using the BURDEN output option. The EMFAC default model year distribution for L.A. County was used.
5. Emission factor calculations assumed an average speed of 15 mph.
6. The PM10 emission factor includes engine exhaust emissions along with brake and tire wear. The DPM emission factor includes engine exhaust emissions only.
7. Engineering estimate based on personal observation.
8. Idling exhaust emission factors from EMFAC 2007 using the EMFAC output option. The EMFAC default model year distribution for L.A. County was used.

Title : Los Angeles County Avg Annual CYr 2005 Default Title
 Version : Emfac2007 V2.3 Nov 1 2006 ** WIS Enabled **
 Run Date : 2006/12/14 07:57:01
 Scen Year: 2005 -- All model years in the range 1965 to 2005 selected
 Season : Annual
 Area : Los Angeles County Average
 I/M Stat : Enhanced Interim (2005) -- Using I/M schedule for area 59 Los Angeles (SC)
 Emissions: Tons Per Day

Calendar Year	2005	2007	2010	2015	2020
	HHDT-DSL	HHDT-DSL	HHDT-DSL	HHDT-DSL	HHDT-DSL
Vehicles	27425	22811	24869	27982	29788
VMT/1000	5538	4551	4993	6088	6766
Trips	138783	115435	125849	141601	150742
Reactive Organic Gas Emissions					
Run Exh	39.07	13.73	12.38	8.81	5.99
Idle Exh	0.82	0.62	0.58	0.51	0.47
Start Ex	0	0	0	0	0
	-----	-----	-----	-----	-----
Total Ex	39.9	14.35	12.96	9.32	6.46
Diurnal	0	0	0	0	0
Hot Soak	0	0	0	0	0
Running	0	0	0	0	0
Resting	0	0	0	0	0
	-----	-----	-----	-----	-----
Total	39.9	14.35	12.96	9.32	6.46
Carbon Monoxide Emissions					
Run Exh	105.2	59.32	50.46	32.23	19.77
Idle Exh	2.7	2.16	2.23	2.33	2.37
Start Ex	0	0	0	0	0
	-----	-----	-----	-----	-----
Total Ex	107.91	61.49	52.69	34.56	22.14
Oxides of Nitrogen Emissions					
Run Exh	175.11	104.89	95.85	67.08	46.2
Idle Exh	5.12	4.44	5.1	6.11	6.7
Start Ex	0	0	0	0	0
	-----	-----	-----	-----	-----
Total Ex	180.23	109.32	100.95	73.19	52.91
Carbon Dioxide Emissions (000)					
Run Exh	17.5	11.8	12.95	15.79	17.55
Idle Exh	0.34	0.28	0.31	0.34	0.37
Start Ex	0	0	0	0	0
	-----	-----	-----	-----	-----
Total Ex	17.84	12.08	13.25	16.13	17.92
PM10 Emissions					
Run Exh	15.05	6.78	5.44	3.07	1.57
Idle Exh	0.15	0.1	0.08	0.05	0.03
Start Ex	0	0	0	0	0
	-----	-----	-----	-----	-----
Total Ex	15.19	6.88	5.52	3.12	1.6
TireWear	0.22	0.18	0.2	0.24	0.27
BrakeWr	0.17	0.14	0.16	0.19	0.21
	-----	-----	-----	-----	-----
Total	15.59	7.2	5.88	3.55	2.08
Lead	0	0	0	0	0
SOx	1.48	0.12	0.13	0.15	0.17
Fuel Consumption (000 gallons)					
Gasoline	0	0	0	0	0
Diesel	1605.41	1087.58	1192.94	1451.99	1612.35

Title : Los Angeles County Avg Annual CYr 2005 Default Title

Version : Emfac2007 V2.3 Nov 1 2006

Run Date : 2006/12/14 08:09:32

Scen Year: 2005 -- All model years in the range 1965 to 2005 selected

Season : Annual

Area : Los Angeles

Year:

Emfac2007 Emission Factors: V2.3 Nov 1 2006

County Average

Table 1: Running Exhaust Emissions (grams/mile; grams/idle-hour)

Temperature: 65F

Relative Humidity: 60%

Calendar Year		2005	2007	2010	2015	2020
Pollutant	Speed MPH	HHD DSL				
ROG	0	16.163	14.57	12.487	9.892	8.569
CO	0	52.988	51.001	48.291	44.707	42.794
Nox	0	100.382	104.615	110.258	117.379	121
CO2	0	6617.134	6617.133	6617.137	6617.135	6617.135
SOx	0	0.55	0.063	0.063	0.063	0.063
PM10	0	2.845	2.358	1.792	1.002	0.525
PM10-Tire	0	0	0	0	0	0
PM10-Brake	0	0	0	0	0	0
Gasoline (mi/gal)	0	0	0	0	0	0
Diesel (mi/gal)	0	0	0	0	0	0

Heavy Equipment

Summary of Emissions from Diesel Fueled Heavy Equipment
Colton Rail Yard

Equipment Owner	Equipment Type ¹	Equipment Make	Equipment Model	Engine Make	Engine Model	Engine Model Year	Engine Rating (hp)	No of Units	Hours of Operation (hrs/yr) ^{2,3}	Load Factor ⁴	2005 Emission Factor (g/bhp-hr) ⁵						2005 Emission Estimates (tpy)					
											ROG	CO	NOx	PM10	DPM	SOx	HC	CO	NOx	PM10	DPM	SOx
Locomotive Shop	Rail Cleaner	Unknown	Unknown	Detroit	4 cyl	2003	125	1	5	0.68	0.52	2.96	5.32	0.25	0.06	0.00	0.00	0.00	0.00	0.00	0.00	
Car Dept	Rerailer	Cline	Unknown	Unknown	Unknown	1987	183	1	365	0.51	1.64	5.52	13.04	0.77	0.77	0.06	0.21	0.49	0.03	0.03	0.00	
Car Dept	Crane	Lorain	LRT-250	Cummins	6BTA	1997	145	1	260	0.43	1.27	3.55	8.35	0.58	0.58	0.06	0.02	0.06	0.15	0.01	0.01	0.00
Car Dept	Forklift	Toyota	6EDU45	Unknown	Unknown	1999	79	1	312	0.30	1.85	4.60	8.36	1.06	1.06	0.06	0.02	0.04	0.07	0.01	0.01	0.00
Total								4								0.10	0.31	0.71	0.05	0.05	0.00	

Notes:

1. In addition to the equipment listed above, UPRR also owns a Rail King Locomotive Mover. This unit did not operate in 2005 and therefore, is not included in the inventory.

2. Hours of operation for the rail cleaner, crane, and forklift estimated by UPRR staff.

3. Hours of operation for the rerailer are an engineering estimate based on discussion with UPRR staff.

4. Default load factors from OFFROAD2007 model.

5. Emission factors from OFFROAD2007 model.

Summary of Emissions from Diesel Fueled Heavy Equipment
Colton Rail Yard

Equipment Owner	Equipment Type ¹	Equipment Make	Equipment Model	Engine Make	Engine Model	Engine Model Year	Engine Rating (hp)	No of Units	Hours of Operation (hrs/yr) ²	Load Factor ³	2007 Emission Factor (g/bhp-hr) ⁴						2005 Emission Estimates (tpy)					
											ROG	CO	NOx	PM10	DPM	SOx	HC	CO	NOx	PM10	DPM	SOx
Locomotive Shop	Rail Cleaner	Unknown	Unknown	Detroit	4 cyl	2003	125	1	5	0.68	0.52	2.96	5.32	0.25	0.06	0.00	0.00	0.00	0.00	0.00	0.00	
Car Dept	Rerailer	Cline	Unknown	Unknown	Unknown	1987	183	1	372	0.51	1.64	5.52	13.04	0.77	0.06	0.06	0.21	0.50	0.03	0.03	0.00	
Car Dept	Crane	Lorain	LRT-250	Cummins	6BTA	1997	145	1	265	0.43	1.27	3.55	8.35	0.58	0.06	0.02	0.06	0.15	0.01	0.01	0.00	
Car Dept	Forklift	Toyota	6EDU45	Unknown	Unknown	1999	79	1	318	0.30	1.85	4.60	8.36	1.06	1.06	0.06	0.02	0.04	0.07	0.01	0.01	0.00
Total								4								0.10	0.32	0.72	0.05	0.05	0.00	

Notes:

1. In addition to the equipment listed above, UPRR also owns a Rail King Locomotive Mover. This unit did not operate in 2005 and therefore, is not included in the inventory.

2. The hours of operation are equal to the 2005 hours of operation multiplied by a growth rate of 1% per year.

3. Default load factors from OFFROAD2007 model.

4. Emission factors from OFFROAD2007 model.

Summary of Emissions from Diesel Fueled Heavy Equipment
Colton Rail Yard

Equipment Owner	Equipment Type ¹	Equipment Make	Equipment Model	Engine Make	Engine Model	Engine Model Year	Engine Rating (hp)	No of Units	Hours of Operation (hrs/yr) ²	Load Factor ³	2010 Emission Factor (g/bhp-hr) ⁴						2010 Emission Estimates (tpy)					
											ROG	CO	NOx	PM10	DPM	SOx	HC	CO	NOx	PM10	DPM	SOx
Locomotive Shop	Rail Cleaner	Unknown	Unknown	Detroit	4 cyl	2003	125	1	5	0.68	0.52	2.96	5.32	0.25	0.06	0.00	0.00	0.00	0.00	0.00	0.00	
Car Dept	Rerailer	Cline	Unknown	Unknown	Unknown	1987	183	1	384	0.51	1.64	5.52	13.04	0.77	0.06	0.06	0.22	0.51	0.03	0.03	0.00	
Car Dept	Crane	Lorain	LRT-250	Cummins	6BTA	1997	145	1	273	0.43	1.27	3.55	8.35	0.58	0.06	0.02	0.07	0.16	0.01	0.01	0.00	
Car Dept	Forklift	Toyota	6EDU45	Unknown	Unknown	1999	79	1	328	0.30	1.85	4.60	8.36	1.06	1.06	0.06	0.02	0.04	0.07	0.01	0.01	0.00
Total								4								0.10	0.33	0.75	0.05	0.05	0.00	

Notes:

1. In addition to the equipment listed above, UPRR also owns a Rail King Locomotive Mover. This unit did not operate in 2005 and therefore, is not included in the inventory.

2. The hours of operation are equal to the 2005 hours of operation multiplied by a growth rate of 1% per year.

3. Default load factors from OFFROAD2007 model.

4. Emission factors from OFFROAD2007 model.

Summary of Emissions from Diesel Fueled Heavy Equipment
Colton Rail Yard

Equipment Owner	Equipment Type ¹	Equipment Make	Equipment Model	Engine Make	Engine Model	Engine Model Year	Engine Rating (hp)	No of Units	Hours of Operation (hrs/yr) ²	Load Factor ³	2015 Emission Factor (g/bhp-hr) ⁴						2015 Emission Estimates (tpy)					
											ROG	CO	NOx	PM10	DPM	SOx	HC	CO	NOx	PM10	DPM	SOx
Locomotive Shop	Rail Cleaner	Unknown	Unknown	Detroit	4 cyl	2003	125	1	6	0.68	0.52	2.96	5.32	0.25	0.06	0.00	0.00	0.00	0.00	0.00	0.00	
Car Dept	Rerailer	Cline	Unknown	Unknown	Unknown	1987	183	1	403	0.51	1.64	5.52	13.04	0.77	0.77	0.06	0.07	0.23	0.54	0.03	0.03	0.00
Car Dept	Crane	Lorain	LRT-250	Cummins	6BTA	1997	145	1	287	0.43	1.27	3.55	8.35	0.58	0.58	0.06	0.03	0.07	0.16	0.01	0.01	0.00
Car Dept	Forklift	Toyota	6EDU45	Unknown	Unknown	1999	79	1	345	0.30	1.85	4.60	8.36	1.06	1.06	0.06	0.02	0.04	0.08	0.01	0.01	0.00
Total								4								0.11	0.34	0.78	0.05	0.05	0.00	

Notes:

1. In addition to the equipment listed above, UPRR also owns a Rail King Locomotive Mover. This unit did not operate in 2005 and therefore, is not included in the inventory.

2. The hours of operation are equal to the 2005 hours of operation multiplied by a growth rate of 1% per year.

3. Default load factors from OFFROAD2007 model.

4. Emission factors from OFFROAD2007 model.

Summary of Emissions from Diesel Fueled Heavy Equipment
Colton Rail Yard

Equipment Owner	Equipment Type ¹	Equipment Make	Equipment Model	Engine Make	Engine Model	Engine Model Year	Engine Rating (hp)	No of Units	Hours of Operation (hrs/yr) ²	Load Factor ³	2020 Emission Factor (g/bhp-hr) ⁴						2020 Emission Estimates (tpy)					
											ROG	CO	NOx	PM10	DPM	SOx	HC	CO	NOx	PM10	DPM	SOx
Locomotive Shop	Rail Cleaner	Unknown	Unknown	Detroit	4 cyl	2003	125	1	6	0.68	0.52	2.96	5.32	0.25	0.06	0.00	0.00	0.00	0.00	0.00	0.00	
Car Dept	Rerailer	Cline	Unknown	Unknown	Unknown	1987	183	1	424	0.51	1.64	5.52	13.04	0.77	0.77	0.06	0.07	0.24	0.57	0.03	0.03	0.00
Car Dept	Crane	Lorain	LRT-250	Cummins	6BTA	1997	145	1	302	0.43	1.27	3.55	8.35	0.58	0.58	0.06	0.03	0.07	0.17	0.01	0.01	0.00
Car Dept	Forklift	Toyota	6EDU45	Unknown	Unknown	1999	79	1	362	0.30	1.85	4.60	8.36	1.06	1.06	0.06	0.02	0.04	0.08	0.01	0.01	0.00
Total								4								0.12	0.36	0.82	0.06	0.06	0.00	

Notes:

1. In addition to the equipment listed above, UPRR also owns a Rail King Locomotive Mover. This unit did not operate in 2005 and therefore, is not included in the inventory.

2. The hours of operation are equal to the 2005 hours of operation multiplied by a growth rate of 1% per year.

3. Default load factors from OFFROAD2007 model.

4. Emission factors from OFFROAD2007 model.

Emergency Generator

Summary of Emissions from the Emergency Generator
 Colton Rail Yard

Location	Equipment Type	Fuel Type	Rating (hp)	Annual of Operation (hr/yr)	Emission Factors (g/hp-hr)						Emission (tpy)					
					ROG	CO	NOx	PM10	DPM	SOx	ROG	CO	NOx	PM10	DPM	SOx
Bowl Area	Emergency Generator	Diesel	50	20	1.14	3.03	14.06	1.00	1.00	0.93	0.001	0.003	0.016	0.001	0.001	0.001

Notes:

1. CARB's ATCM for Stationary Compression Ignition Engines limits non-emergency operation to 20 hours per year.
2. Emission factors from AP-42, Table 3.3-1, 10/96.

Appendix B

Growth Rate Data

Union Pacific Railroad: Key Operating Measures
 Annual Gross Ton-Miles, Revenue Ton-Miles, & Diesel Fuel Consumption

Year	U.P. Revenue Ton Miles per Gallon of Diesel Consumed	% Change	Diesel Fuel Consumed (millions)	% Change	U.P. Revenue Ton Miles (billions)	% Change	U.P. Gross Ton Miles (billions)	% Change
1996	392	-	824	-	323	-	760	-
1997	368	-	1,229	-	452	-	860	13.2%
1998	376	2.2%	1,150	-6.4%	432	-4.4%	826	-3.9%
1999	380	1.2%	1,244	8.2%	473	9.5%	898	8.7%
2000	375	-1.3%	1,293	3.9%	485	2.6%	931	3.7%
2001	391	4.2%	1,287	-0.5%	504	3.8%	958	2.8%
2002	394	0.8%	1,315	2.2%	519	3.0%	994	3.8%
2003	401	1.6%	1,330	1.1%	533	2.7%	1019	2.5%
2004	397	-1.0%	1,377	3.5%	546	2.5%	1038	1.8%
2005	406	2.2%	1,353	-1.7%	549	0.5%	1044	0.6%
2006	412	1.6%	1,372	1.4%	565	3.0%	1073	2.7%
2007	424	2.8%	1,326	-3.4%	562	-0.6%	1052	-1.9%
Average % Change		1.4%		0.8%		2.3%		2.1%

Notes:

Source: Union

Quarterly Earnings Releases and Analyst Presentations (4th Quarter each year 1997-2007)

<http://www.up.com/investors/earnings/index.shtml>

1996 data from UPRR Report R-1 to Surface Transportation Board, provided as reference point to pre-UP/SP merger.

1996-1997 data not included in averages shown above. UP/SP merger was completed on Sept. 11, 1996; 1998 is first year that is representative for comparison to current operations.

Calculation of Projected Growth Rate
Colton Rail Yard

Calendar Year	Growth Factor
2005	1.00
2006	1.01
2007	1.02
2008	1.03
2009	1.04
2010	1.05
2011	1.06
2012	1.07
2013	1.08
2014	1.09
2015	1.10
2016	1.12
2017	1.13
2018	1.14
2019	1.15
2020	1.16

Notes:

1. Assumes a growth rate of 1% per year from 2005.